LOSSY COMPRESSION ANALYSIS OF GOPRO AUDIOS BEFORE AND AFTER

YOUTUBE LAUNDRY

by

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Lossy Compression Analysis of GoPro Audios Before and After YouTube Laundry

Thesis directed by Associate Professor Catalin Grigoras

ABSTRACT

Action cameras are digital cameras designed to capture action shots in an immersive manner, and GoPro is a leading manufacturer of action cameras. When a GoPro camera captures potential evidence of a crime or other occurrence of interest, the authenticity of the video may need to be established, especially for judicial or extra-judicial purposes. Establishing a video's authenticity is made more difficult when the video has been uploaded to the YouTube platform because the uploading process strips out or 'launders' the metadata pointing back to the source camera. Because of this laundering effect, new methods for authentication of YouTube-downloaded GoPro audios and videos should be explored. We conducted an exploratory study of the Modified Discrete Cosine Transform coefficients of GoPro audios before and after YouTube laundry. To that end, we analyzed 400 audios from ten GoPro cameras and compared them to a reference database of 156 models, including samples from the ten GoPro cameras. Then, we reported the results and discussed some scientific limitations and possibilities apparent from our analysis.

The form and content of this abstract are approved. I recommend its publication.

Approved: Catalin Grigoras

DEDICATION

To my beautiful wife, you are the most generous, encouraging, and supportive person I know. Without you, this degree likely would be a daydream. P.S. I promise to watch a whole movie with you soon.

To my parents, you have given me the freedom to pave my own way. Thank you.

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LIST OF ABBREVIATIONS

AAC-LC – Advanced Audio Coding Low-Complexity

ENFSI – European Network of Forensic Science Institutes

FPS – Frames Per Second

HEVC – High Efficiency Video Coding

KBD – Kaiser-Bessel Derived Window

MDCT – Modified Discrete Cosine Transform

MFCC – Mel-Frequency Cepstral Coefficient

MP3 – MPEG-1 Audio Layer III or MPEG-2 Audio Layer III

MPEG – Moving Picture Experts Group

PCM – Pulse-Code Modulation

SWGDE – Scientific Working Group on Digital Evidence

WAV – Waveform Audio File Format

CHAPTER I

INTRODUCTION

Action cameras are digital cameras designed to capture action shots in an immersive manner. They can be worn on the body, mounted to sports equipment, attached to vehicles (or even to pets), placed on tripods/unipods, or held by hand. They are typically compact, rugged, and waterproof, at least at surface depth. GoPro is considered a leader in the action camera genre, having sold more than four million cameras in 2019 alone (Statista, 2022a). When a GoPro camera captures potential evidence of a crime or other occurrence of interest, it can be necessary to establish that the recording is authentic, especially for judicial purposes.

The Scientific Working Group on Digital Evidence (SWGDE) defines authentication as "the process of substantiating that the data is an accurate representation of what it purports to be" (SWGDE, 2016b). It further states that "an audio authentication examination seeks to determine if a recording is consistent with the manner in which it is alleged to have been produced" (SWGDE, 2016a).

Audio authenticating can be relatively straightforward when the purported source camera is available for testing or when the questioned file's metadata contains information about the recording history, such as camera make, model, and settings (although it is possible to falsify some metadata). On the other hand, authentication can be difficult when we have neither the camera nor the recording history in file metadata.

YouTube is the biggest online video platform in the world with an estimated 2.24 billion users globally (Statista, 2022b). Previous research has revealed that YouTube re-encodes every video uploaded to its platform (Giammarrusco, 2014; Rabbio, 2019) which strips out all

metadata that could have pointed back to the source camera (Whitecotton, 2017). This means that a YouTube downloaded recording is a recording 'laundered' of its metadata.

According to *SWGDE Best Practices for Digital Audio Authentication* (SWGDE, 2018), Modified Discrete Cosine Transform (MDTC) Analysis is a form of audio authentication. MDTC is a "Fourier-related transform based on the type-IV discrete cosine transform" (Mallegg, 2014). MDCT analysis can be used to assess the lossy compression history of an evidence audio signal by detecting and analyzing the MDCT coefficients left behind by lossy compression algorithms.

Popular lossy compression algorithms such as AAC-LC v1, AAC-LC v2, AC-3, MP3, OGG-Vorbis, and WMA are MDCT-based. Generally, they transform audio samples from a time representation to a spectral/frequency representation, divide the samples into windows or frames of a certain length, apply a filterbank and/or MDCT to each, and overlap them. MDCT coefficients are an output of this process. Parallel to this, regions of less significance perceptually are estimated by a psychoacoustic model. Then, the data is quantized, ignoring (or assigning fewer bits to) the less significant regions. Finally, the quantized data is converted into a bitstream (Bosi & Goldberg, 2002, as cited in Kim & Rafii, 2018).

Literature Review

Previous research has demonstrated that the artifacts left behind by lossy compression algorithms can be used to help reconstruct the encoding parameters and MDCT coefficients from a decoded audio stream. Herre & Schug investigated the feasibility of extracting perceptual encoding parameters from decoded WAV PCM signals based on the MPEG-2/4 AAC codec (Herre & Schug, 2000). They proposed algorithms to recover encoding parameters such as

filterbank/transform type and configuration, framing grid and offset, quantization information, and other parameters like joint stereo coding mode.

In a similar study, Moehrs et al. proposed algorithms to reconstruct encoding parameters based on the MPEG-1/2 Layer 3 (MP3) codec (Moehrs et al., 2002).

Luo et al. introduced a method to distinguish original WAV PCM files from previously encoded ones using the MP3 and WMA compression schemes (Luo et al., 2012). They analyzed two novel feature sets derived from MDCT coefficients and were able to estimate the compression format and bitrate. Later, they extended their method to include an additional compression scheme (AAC) and an additional feature set (Mel-Frequency Cepstral Coefficients or MFCCs) (Luo et al., 2014).

Kim & Rafii proposed a system for encoder and bitrate identification that analyzes the decoded audio signal's compression parameters based on the AAC, AC-3, MP3, Vorbis, and WMA compression formats (Kim & Rafii, 2018).

Grigoras & Smith introduced a framework and methods to compare original AAC decoded WAV PCM files to a large reference database of original and edited samples (Grigoras & Smith, 2019). They proposed a model comprised of the decoded MDCT coefficients, the Long Term Average Sorted Spectrum (LTASS), and the Audio Compression Level (ACL). The results were reported as logarithmic likelihood ratios (LLRs) and measurement uncertainties ("standard error of the mean, SEM"). Within the broader study, the authors looked at the effects of social media uploading/downloading on the WAV PCMs compared to the database samples, including from YouTube.

Research Problem

Seemingly absent from the previous literature is any research into the MDCT coefficients of GoPro audios before and after YouTube laundry. Also absent are any proposed methods to compare GoPro audios to a large-scale database of models, and to report the results as LLRs. To begin to address this knowledge gap, we propose an exploratory study of the MDCT coefficients of GoPro audios before and after YouTube laundry. To that end, we introduce a system to analyze the decoded GoPro audio signal's MDCT coefficients computed based on six compression schemes, AAC-LC v1 (Sine based window), AAC-LC v2 (Kaiser-Bessel derived window, KBD), AC-3, MP3, OGG-Vorbis, and WMA. We analyze 400 audios from ten GoPro cameras and compare them to a reference database of 156 models, including samples from the same ten GoPro cameras. Then, we report the results and discuss some scientific limitations and possibilities apparent from our analysis.

CHAPTER II

MATERIALS

Ten GoPro cameras were used in this study. They consisted of five GoPro models, two cameras per model. The models were:

1. HERO6 Black (September 2017)

2. HERO7 Black (September 2018)

3. HERO8 Black (October 2019)

4. HERO9 Black (September 2020)

5. HERO10 Black (September 2021)

The specific cameras were:

1. HERO6 Black, SN: C3221324537863, software version 02.10.00

2. HERO6 Black, SN: C3221324659856, software version 02.10.00

3. HERO7 Black, SN: GP26509582, software version 01.90.00

4. HERO7 Black, SN: GP26536229, software version 01.90.00

5. HERO8 Black, SN: C3333424626435, software version 02.50.00

6. HERO8 Black, SN: C3333424822061, software version 02.50.00

7. HERO9 Black, SN: C3441326433163, software version 01.60.00

8. HERO9 Black, SN: C3441326855809, software version 01.60.00

9. HERO10 Black, SN: C3461324652860, software version 01.10.00

10. HERO10 Black, SN: C3461324653843, software version 01.10.00

These GoPro cameras offered extensive configurability over video settings. As an example, the HERO9 Black cameras offered settings for video resolution (1080p to 5k), frame rate (24 to 240 fps), digital lens ('Narrow' to 'Super View'), codec ('H.264 + HEVC' and

'HEVC'), bit rate (Standard and High) plus many more settings. When all possible combinations of settings were accounted for, the number of potential configurations ran into the hundreds.

No similar configurability was available for audio. Sample rate, bit depth, bit rate, and compression format were not adjustable. The audio always was 2 channels, 48 kHz sample rate, 192 kb/s bit rate, AAC-LC format, and mp4a-40-2 codec ID, regardless of video or global settings. Multiple combinations of video and global settings were tested, and the audio attributes always remained the same. Not every possible settings combination was tested, but enough were tested to give us a reasonable degree of confidence that video and global settings did not affect audio attributes. For this reason, a single configuration was used for all recordings. It bears repeating however that any configuration could have been used without affecting audio attributes.

All the cameras had a wind-noise reduction filter available. The filter could be left in the auto position, which was its default, or turned on or off manually. In the auto position, the filter would be active only when wind noise was detected. When in the on position, the filter would be active all the time; and when in the off position, the filter would be inactive all the time. When the filter was active, it would switch the audio from true stereo to dual mono. The number of audio channels would not change, however, only the stereo or dual-mono relationship of the channels. Since the recordings were made indoors, no wind noise was present or would be detected, so no filter would be active in the default position. For this reason, the filter was left in that position.

Two other audio-related options were available but were not used for this study. One was to connect an external microphone (or other audio device) to each GoPro camera. Using an external microphone instead of the internal ones could be valuable for future research but was

beyond the scope of this study. The other option was to have the cameras create a separate WAV file for each video in addition to the standard .mp4 audio track. The problem was that WAV files, although potentially of higher quality, were not supported by YouTube. They first would need to be converted to videos. The process of converting WAV files to videos, then uploading them to YouTube, could be valuable for future research but was also beyond the scope of this study.

We settled on the following configuration:

- Video resolution: 1920x1080

- Frame rate: 120 FPS

- Digital lens: Linear (L)

- Bitrate: Standard (HERO8-10 only)

- Compression format: H.264 + HEVC (HERO7-10 only)

- Wind-noise reduction: Auto (default). This was termed 'Manual Audio Control' on the HERO6

We chose the frame rate of 120 FPS because it resulted in more YouTube audio download options compared to the frame rates of 24, 30, or 60 FPS at 1920x1080 resolution. We chose the linear (L) digital lens based on personal preference to have the typical lens distortion artifact removed.

CHAPTER III

METHODOLOGY

From each of the 10 GoPro cameras, three data sets were created: Group A (reference recordings), Group B (test recordings), and Group C (YouTube laundered derivatives).

The Group A recordings served as the reference recordings. Five (5) recordings were made of eight-to-ten-minute durations on each of the ten cameras. The final durations varied based on each camera's maximum file length before splitting the recording into a new file segment. This worked out to be 8:02 for the HERO6, 8:51 for the HERO7-9, and 10 minutes for the HERO10. The HERO10 recordings were 10 minutes long because those cameras did not segment recordings before reaching the study's target duration of ten minutes.

The Group B recordings served as the test recordings and were uploaded to YouTube using a Google account. Ten (10) recordings were made of one-minute durations per camera. The Group C files were the YouTube laundered or downloaded derivatives of the Group B uploaded files.

All recordings were made indoors in four rooms ranging in size from 160 to 350 square feet (approximately). No speech or background babble noise was present during the recordings, only room noise with occasional outdoor sounds bleeding through. For each camera, 40% of recordings were made in the smallest room, which had the loudest equipment noise, and 20% were made in each of the other three rooms. Placements and positionings were kept approximately–but not exactly–the same from camera to camera.

The Group A and Group B recordings were transferred directly from the cameras via their USB-C ports. An image and PDF viewing application bundled with the Mac operating system was used to download the files. Alternatively, the recordings could have been uploaded

via the cameras' built-in WI-FI to the GoPro cloud backup service (which required a subscription), and then downloaded from that service. This would have produced identical bit for bit files but would have taken much longer.

All Group B recordings, 100 total, were uploaded to YouTube. They then were downloaded using the open-source software application youtube-dl version 2021.06.06 and became the Group C files, also 100 total. The command was:

youtube-dl -f 140 https://YouTubeLink.

The format code 140 from the above command refers to an audio-only m4a_dash container (mp4a.40.2), 129k bit rate, 44.1kHz sample rate. Several 48kHz formats which shared the same sample rate with the uploaded recordings were available, but the best, format code 251, a WEBM format, introduced a cutoff frequency around 20kHz. Since the 44.1kHz 140 format did not introduce this cutoff frequency, it proved to be a much better approximation of the uploaded files despite the mismatched sample rate, therefore the 140 format was used.

All Group A recordings (originally lossy compressed AAC-LC stereo files) were transcoded to uncompressed WAV PCM stereo and mono-left and mono-right files using the open-source software application FFmpeg version 4.4. The commands were:

1. ffmpeg -i Input.mp4 -map 0:a StereoOutput.wav
2. ffmpeg -i StereoOutput.wav -map_channel 0.0.0 MonoOutput_left.wav -map_channel 0.0.1 MonoOutput_right.wav.

Next, six sets of MDCT coefficients were computed for each mono-left and mono-right file, one set each for the following popular verified compression algorithms: AAC-LC v1 (Sine based window), AAC-LC v2 (Kaiser-Bessel derived window, KBD), AC3, MP3, OGG-Vorbis and WMA. Then, these Group A coefficients were added to a reference database against which the Group B and Group C files would later be compared. This reference database was populated with

156 models comprising MDCT coefficients from recordings from 117 smartphones, tablets, and cameras, including the ten GoPro cameras used for this study. The recordings were made in a variety of indoor and outdoor environments and captured a variety of source sounds (or silence). The full list of the database models can be found in Appendix A.

Next, the 100 Group B and 100 Group C files (originally lossy compressed AAC-LC stereo files) were transcoded to uncompressed WAV PCM stereo and mono-left and mono-right files using FFmpeg. The commands were:

1. ffmpeg -i Input.m4a -map 0:a StereoOutput.wav

2. ffmpeg -i StereoOutput.wav -map_channel 0.0.0 MonoOutput_left.wav -map_channel 0.0.1 MonoOutput_right.wav.

Then the resulting 400 mono-left and mono-right files' MDCT coefficients were computed for six popular compression algorithms (AAC-LC v1 [Sine based window], AAC-LC v2 [Kaiser-Bessel derived window, KBD], AC3, MP3, OGG-Vorbis and WMA). These coefficients were compared to the coefficients from the reference database of 156 models (from 117 devices) which is described more thoroughly above. The results were reported as LLRs based on a chi-squared test and placed in a text file named "MDCT-11-Frame-Offset-Analysis.txt". Each line in the file represents a comparison between the test file and one database reference model. Since there are 156 models, there are 156 lines that are sorted from highest LLR to lowest LLR (1/156 is the highest, 156/156 is the lowest). Figure 1 shows the top 12 and bottom 12 lines from an "MDCT-11-Frame-Offset-Analysis.txt" file for the test file "H6-56-1920x1080-120-L-Auto-NA-NA-B-01-Rm3-a-pcm-L.wav".

```
●●●                        MDCT-11-Frame-Offset-Analysis.txt
1/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm3                            |        => LR=52572.8817, LLR=4.7208, S=48.9906
2/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4                                     => LR=30281.1218, LLR=4.4812, S=28.2178
3/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2                                     => LR=12659.1796, LLR=4.1024, S=11.7966
4/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm1                                     => LR=5396.2065, LLR=3.7321, S=5.0285
5/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm2                                     => LR=2489.2935, LLR=3.3961, S=2.3197
6/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm3                                     => LR=2247.3587, LLR=3.3517, S=2.0942
7/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1                                     => LR=1151.46, LLR=3.0612, S=1.073
8/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL                     => LR=154.9575, LLR=2.1902, S=0.1444
9/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2                                     => LR=142.5227, LLR=2.1539, S=0.13281
10/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4                                    => LR=80.4167, LLR=1.9053, S=0.074937
11/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm1                                    => LR=36.4342, LLR=1.5615, S=0.033952
12/156 [AAC-LC-v2-48kHz-128kbps-2c]-Video-Samsung-Galaxy-S5-Android-442-snCG-indoor-20220203 => LR=22.176, LLR=1.3459, S=0.020665
...
145/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Butterfly-S-snGAR                                 => LR=2.4028e-08, LLR=-7.6193, S=2.2391e-11
146/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-snPHBL                                        => LR=2.1751e-08, LLR=-7.6625, S=2.0269e-11
147/156 [AAC-LC-v2-16kHz-096kbps-1c]-Video-Meizu-MX-4-Pro-snGAR                                  => LR=5.8291e-09, LLR=-8.2344, S=5.4319e-12
148/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-820-snGAR                                  => LR=4.4588e-09, LLR=-8.3508, S=4.155e-12
149/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-snGAR                                         => LR=4.4004e-09, LLR=-8.3565, S=4.1006e-12
150/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-816-snGAR                                  => LR=2.9468e-09, LLR=-8.5306, S=2.746e-12
151/156 [AAC-LC-v2-48kHz-096kbps-1c]-Video-HTC-Desire-X-Android-411-snCG-indoor-20220203         => LR=2.6717e-09, LLR=-8.5732, S=2.4896e-12
152/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-Eye-snGAR                                  => LR=2.0953e-09, LLR=-8.6788, S=1.9525e-12
153/156 [AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-(M8)-snPHBL                                   => LR=6.1243e-10, LLR=-9.2129, S=5.707e-13
154/156 [AAC-LC-v2-48kHz-192kbps-2m]-Video-HTC-Desire-500-snGAR                                  => LR=6.1212e-10, LLR=-9.2132, S=5.7041e-13
155/156 [AAC-LC-v2-48kHz-192kbps-1c]-Video-HTC-Desire-510-snGAR                                  => LR=5.0817e-10, LLR=-9.294, S=4.7354e-13
156/156 [AAC-LC-v2-48kHz-192kbps-1c]-Video-HTC-One-M8-snGAR                                      => LR=4.0004e-10, LLR=-9.3979, S=3.7278e-13
```

Figure 1. MDCT-11-Frame-Offset-Analysis.txt (trimmed)

The same results were plotted in a file named "MDCT-11-Frame-Offset-Analysis.png"

which positioned the LLRs within the verbal scale introduced in "ENFSI Guideline for

Evaluative Reporting in Forensic Science" (ENFSI, 2015). Figure 2 shows one such "MDCT-11-

Frame-Offset-Analysis.png" file also for the test file "H6-56-1920x1080-120-L-Auto-NA-NA-

B-01-Rm3-a-pcm-L.wav". Figure 3 shows the same file rotated, zoomed, and trimmed to show

only the top 12 and bottom 12 plots based on their LLRs.

Figure 2. MDCT-11-Frame-Offset-Analysis.png

Figure 3. MDCT-11-Frame-Offset-Analysis.png (edited)

The first line (1/156) from every "MDCT-11-Frame-Offset-Analysis.txt" file, 400 files in

total, was compiled into a spreadsheet. As a reminder, the first line indicates the most consistent

reference model (with the highest LLR) compared to the Group B or C test file. Table 1 displays

ten rows from within this spreadsheet (Table 5 shows the complete spreadsheet and can be found

in Appendix B). Notice in the first row that the test file and its most consistent reference model

are from the same make and model of camera, an "H10", which is an abbreviation for a GoPro HERO10 Black. When the test file and its most consistent reference model are from the same make and model of camera, we will refer to it as a *camera model* match. Notice in the second row of the table that the test file and its most consistent reference model are from the same make but a different model of camera, an "H10" for the test file and an "H9", which is an abbreviation for GoPro HERO9 Black, for the most consistent reference model. When the test file and its most consistent reference model are from the same make but a different model of camera, we will refer to it as a *camera make* match. A *camera model* match is more discriminating than a *camera make* match, but both have potential forensic value. The results in the next section will simply report these two types of matches.

Table 1. Most Consistent Model per Test File (10 rows)

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H10-43-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	36637695.92	7.5639	70.104
H10-43-1920x1080-120-L-Auto-Std-H264-C-01-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	65968.7664	4.8193	23.477
H10-43-1920x1080-120-L-Auto-Std-H264-C-01-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2905251.848	6.4632	73.613
H10-43-1920x1080-120-L-Auto-Std-H264-C-02-Rm4-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	69900.4806	4.8445	26.1081
H10-43-1920x1080-120-L-Auto-Std-H264-C-02-Rm4-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2292484.805	6.3603	75.6302
H10-43-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	38577.281	4.5863	22.3346
H10-43-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	406072.0154	5.6086	46.0083
H10-43-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	259801.7743	5.4146	43.7622
H10-43-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	2978104.841	6.4739	56.8589
H10-43-1920x1080-120-L-Auto-Std-H264-C-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	53677.6966	4.7298	38.97

CHAPTER IV

RESULTS

As a reminder, we analyzed 400 audios from ten GoPro cameras and compared them to a reference database of 156 models, including samples from the ten GoPro cameras. The 400 audios were from before and after YouTube laundry. The Group B files were before YouTube laundry and the Group C files were after YouTube laundry. Table 5 in Appendix B reports all 400 Group B and Group C test files along with their most consistent reference models based on LLRs.

When the test file and its most consistent reference model were from the same make and model of camera, we referred to it as a *camera model* match. Table 2 displays the number and percentage of *camera model* matches for each GoPro camera model by group. It also displays the totals for Groups B and C combined. Group B match percentages ranged from a high of 100% (HERO6) to a low of 20% (HERO8) and averaged 69%. Group C match percentages ranged from a high of 100% (HERO6) to a low of 8% (HERO8) and averaged 46%. The drop in match percentages from Group B to Group C ranged from a high of 60% (HERO7) to a low of 0% (HERO6) with an average drop of 23%.

Table 2. Camera Model Matches between Reference and Test

Model	Group B (/40)		Group C (/40)		Total (/80)	
H6	40	100%	40	100%	80	100%
H7	36	90%	12	30%	48	60%
H8	8	20%	3	8%	11	14%
H9	15	38%	5	13%	20	25%
H10	39	98%	32	80%	71	89%
Mean	28	69%	18	46%	46	58%

When the test file and its most consistent reference model were from the same make but a different model of camera, we referred to it as a *camera make* match. Table 3 displays the

number and percentage of *camera make* matches for each GoPro camera model by group. Group B match percentages ranged from a high of 100% (HERO6, 8, and 10) to a low of 78% (HERO9) and averaged 95%. Group C match percentages ranged from a high of 100% (HERO6 and 10) to a low of 50% (HERO7) and averaged 83%. The drop in match percentages from Group B to Group C ranged from a high of 45% (HERO7) to a low of 0% (HERO6 and 10) with an average drop of 12%.

Table 3. Camera Make Matches between Reference and Test

Model	Group B (/40)		Group C (/40)		Total (/80)	
H6	40	100%	40	100%	80	100%
H7	38	95%	20	50%	58	73%
H8	40	100%	38	95%	78	98%
H9	31	78%	28	70%	59	74%
H10	40	100%	40	100%	80	100%
Mean	38	95%	33	83%	71	89%

CHAPTER V

CONCLUSIONS

In the introduction, we proposed an exploratory study into the MDCT coefficients of GoPro audios before and after YouTube laundry. We analyzed 400 audios–or test files–from ten GoPro cameras and compared them to a reference database of 156 models, including samples from the ten GoPro cameras. For each of the 400 test files, we calculated the most consistent reference model, the one with the highest LLR, and added it to a spreadsheet which formed the basis for our results and conclusions (see Table 5 in Appendix B).

Table 2 reported the number and percentage of times the test file and its most consistent reference model were from the same make and model of camera, which we referred to as a *camera model* match. We were encouraged by the *camera model* matches for the HERO6, both Group B and Group C, as they matched 100% of the time. Unfortunately, the same cannot be said for the other GoPro models. When all five GoPro models were averaged, the matches were only 69% for Group B files, 46% for Group C files, and 58% for both groups combined. Perhaps the five GoPro models produce similar enough files that the source models cannot be discerned using MDCT coefficients alone.

Next, we reported what we called *camera make* matches which were instances when the test file and its most consistent reference model were from the same make–but different model– of camera (Table 3). We saw much better results from these matches. In fact, for three of the five GoPro models tested, the camera makes matched at least 95% of the time. When all five GoPro models were averaged, the camera makes matched 95% of the time for Group A files, 83% for Group B files, and 89% for both groups combined.

We noticed that the averages for Group B files outperformed the averages for Group C files as reported in Table 2 and Table 3. This could be because all the Group C files had been laundered but none of the GoPro reference models had been, leaving no laundered models for comparisons. Future research could include YouTube laundered derivatives.

The GoPro recordings for this study were AAC-LC v2 / 48KHz / 192kbps / 2-ch and were made indoors with room noise only. By contrast, the database reference models for this study represented multiple AAC versions, sample rates, bit rates, and channel configurations. Also, the recordings were made in a variety of indoor and outdoor recording environments capturing a variety of sounds including traffic noise and speech. We wondered if mixing the formats and recording environments might have skewed our results. To address this, Catalin Grigoras, Ph.D., ran some parallel experiments using two (2) somewhat more optimized versions of the database. Table 4 shows some of his preliminary results. The upper part of the table shows 100% correct GoPro *camera make* matches for all five GoPro models based on comparing four Group C files of each model to a reference database of 82 models. The lower part of the table shows 93% correct GoPro *camera make* matches based on comparing forty HERO9 Group B files to a reference database of 211 models. These results are very encouraging and suggest the need for refinement and optimization of the database.

Table 4. Preliminary Results from Two Optimized Databases

82 Camera Models:		
Model	**Group C (/4)**	
H6	4	100%
H7	4	100%
H8	4	100%
H9	4	100%
H10	4	100%
211 Camera Models:		
Model	**Group B (/40)**	
H9	37	93%

We chose primarily to focus on the first line (line 1/156, Figure 1) from each "MDCT-11-Frame-Offset-Analysis.txt" file for our results since it represented the highest LLR and therefore was the most consistent reference model to the Group A or Group B test file. Some of the other lines (2/156 through 156/156) have potential value as well because high LLRs, regardless of position, still indicate consistency, and low LLRs still indicate inconsistency. And for verification, sometimes identifying the inconsistent reference models can be as important as identifying consistent ones.

Future Research

In future research, the reference database could be refined and optimized. This could be accomplished by restricting the database only to models of the same format and from the same recording environment. The reference database could be expanded to include YouTube laundered derivatives of the models. Also, more models could be added based on recordings from additional action (and regular) cameras, smartphones, and tablets.

The test and reference files could be prepared in alternate ways. For example, they could be downloaded from YouTube using different downloading tools besides youtube-dl. They also could be encoded using different encoding tools besides FFmpeg.

Manipulated derivatives of the test files could be created and used for the analyses. Edits could be made using various audio editors, the files could be double- or triple-compressed, or they could be transcoded to and from additional formats.

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APPENDIX

A. Reference Database Models

[AAC-LC-v1-44kHz-048kbps-1c]-Video-Meizu-MX-snGAR

[AAC-LC-v1-44kHz-064kbps-1c]-Video-HTC-Explorer-snGAR

[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR

[AAC-LC-v1-44kHz-128kbps-2c]-Video-HTC-Evo-3D-snGAR

[AAC-LC-v1-44kHz-128kbps-2c]-Video-HTC-Rhyme-snGAR

[AAC-LC-v1-44kHz-128kbps-2c]-Video-HTC-Sensation-XL-snGAR

[AAC-LC-v1-48kHz-156kbps-2c]-Video-Sony-Xperia-PRO-I-Android-11-snPHBL

[AAC-LC-v1-48kHz-192kbps-2c]-Video-DJI-Pocket-2-snPHBL

[AAC-LC-v2-16kHz-096kbps-1c]-Video-Meizu-15-Android-711-snGAR

[AAC-LC-v2-16kHz-096kbps-1c]-Video-Meizu-MX-4-core-snGAR

[AAC-LC-v2-16kHz-096kbps-1c]-Video-Meizu-MX-4-Pro-snGAR

[AAC-LC-v2-16kHz-096kbps-1c]-Video-Meizu-Pro-6-Plus-Android-601-snGAR

[AAC-LC-v2-32kHz-128kbps-2c]-Video-Samsung-NX200-outdoor-snPHBL

[AAC-LC-v2-32kHz-128kbps-2c]-Video-Samsung-NX200-street-snPHBL

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-4s-iOS-07-1-2-snVISd02

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-4s-iOS-07-1-2-snVISd02-indoor

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-4s-iOS-07-1-2-snVISd02-outdoor

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-5c-iOS-10-2-1-snVISd05

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-6-iOS-08-4-0-snVISd06

[AAC-LC-v2-44kHz-064kbps-1c]-Video-Apple-iPhone-6-Plus-iOS-8-1-0-snPHBL

[AAC-LC-v2-48kHz-064kbps-1c]-Video-Blackberry-Bold-9930-snCG-outdoor-20210326

[AAC-LC-v2-48kHz-064kbps-1c]-Video-Blackberry-Curve-9310-snCG-indoor-20220203

[AAC-LC-v2-48kHz-064kbps-1c]-Video-Blackberry-Curve-9310-snCG-outdoor-20210407

[AAC-LC-v2-48kHz-096kbps-1c]-Video-HTC-Desire-X-Android-411-snCG-indoor-20220203

[AAC-LC-v2-48kHz-096kbps-2c]-Video-Huawei-MediaPad-T3-10-Android-7-snMiHa-20201201

[AAC-LC-v2-48kHz-128kbps-1c]-Video-Lenovo-TabM7-Android-9-snCG-20201219

[AAC-LC-v2-48kHz-128kbps-1c]-Video-Sony-Xperia-E4g-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-HTC-Droid-Incredible-4G-LTE-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-HTC-One-S-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-HTC-One-SV-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-HTC-One-X-plus-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-HTC-Titan-II-(var)-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F1-plus-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F11-Android-9-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F1s-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F3-Android-60-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F5-Android-711-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Oppo-F9-Pro-Android-810-snGAR

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Panasonic-Lumix-GH5-II-snPHBL

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Samsung-Galaxy-S5-Android-442-snCG-indoor-20220203

[AAC-LC-v2-48kHz-128kbps-2c]-Video-Sony-Xperia-Z-Ultra-snGAR

[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101

[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20220203

[AAC-LC-v2-48kHz-128kbps-2m]-Video-Oppo-Realme-1-Android-810-snGAR

[AAC-LC-v2-48kHz-128kbps-2m]-Video-Sony-Xperia-E4-snGAR

[AAC-LC-v2-48kHz-156kbps-1c]-Video-LG-G-Pad-10-1-snGAR

[AAC-LC-v2-48kHz-156kbps-1c]-Video-LG-G-Pad-7-0-snGAR

[AAC-LC-v2-48kHz-156kbps-1c]-Video-LG-G2-mini-snGAR

[AAC-LC-v2-48kHz-156kbps-1c]-Video-LG-Optimus-L7-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-AKA-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G-Flex-2-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G2-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G3-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G4-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G5-Android-601-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-G7-ThinQ-Android-800-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-Nitro-HD-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-Optimus-G-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-Optimus-VU-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-LG-V20-Android-70-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-Oppo-N1-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-Sony-Xperia-Z3-snGAR

[AAC-LC-v2-48kHz-156kbps-2c]-Video-Zeiss-ZX1-snPHBL

[AAC-LC-v2-48kHz-156kbps-2m]-Video-LG-Q6-Android-711-snGAR

[AAC-LC-v2-48kHz-156kbps-2m]-Video-Oppo-N1-Cyanogen-snGAR

[AAC-LC-v2-48kHz-156kbps-2m]-Video-Sony-Xperia-Z3-Tablet-snGAR

[AAC-LC-v2-48kHz-192kbps-1c]-Video-HTC-Desire-510-snGAR

[AAC-LC-v2-48kHz-192kbps-1c]-Video-HTC-One-M8-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Google-Pixel-4a-5G-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Google-Pixel-5-Android-11-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm1

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm3

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm4

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3

[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm2
[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm3
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2
[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm3
[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm3
[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm2
[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-Honor-7X-Android-70-snPHBL
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[AAC-LC-v2-48kHz-192kbps-2c]-Video-Honor-View-20-Android-9-snPHBL
[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-10-Android-601-snGAR
[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-10-snPHBL
[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Butterfly-2-snGAR
[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Butterfly-S-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-816-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-820-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-Desire-Eye-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-(M8)-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-(M9)-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-One-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-U-Ultra-Android-70-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-HTC-U11-Android-711-snGAR

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-10-Pro-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P10-Lite-Android-800-snCG-indoor-20220203

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P10-Lite-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P10-Plus-Android-70-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P20-Android-810-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P20-Pro-Android-810-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P30-Lite-Android-9-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P9-Android-60-snPHBL

[AAC-LC-v2-48kHz-192kbps-2c]-Video-OnePlus-GM1910-snVLAD-Android-10

[AAC-LC-v2-48kHz-192kbps-2c]-Video-OnePlus-One-snGAR

[AAC-LC-v2-48kHz-192kbps-2m]-Video-HTC-Desire-500-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Canon-EOS-M50-Mark-II-snPHBL

[AAC-LC-v2-48kHz-256kbps-2c]-Video-HTC-Re-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-A20e-Android-11-snCG-indoor-20220203

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-Core-Prime-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-E7-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-Note-4-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-Note-Edge-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S20-FE-Android-10-snTEO

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S21-Ultra-Android-11-snPHBL

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S6-edge-Android-70-snCG-indoor-20220203

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S6-edge-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S6-snGAR

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S9-plus-Android-10-snCG-babble

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S9-plus-Android-10-snCG-indoor-20220203

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S9-plus-Android-10-snCG-office

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S9-plus-Android-10-snCG-outdoor

[AAC-LC-v2-48kHz-256kbps-2c]-Video-Samsung-Galaxy-S9-plus-Android-10-snCG-street

[AAC-LC-v2-48kHz-256kbps-2m]-Video-Canon-EOS-R3-snPHBL

B. Top Matches

Table 5. Most Consistent Model per Test File (all)

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H10-43-1920x1080-120-L-Auto-Std-H264-B-01-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1535598.789	6.1863	60.1809
H10-43-1920x1080-120-L-Auto-Std-H264-B-01-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	79801585.74	7.902	94.4596
H10-43-1920x1080-120-L-Auto-Std-H264-B-02-Rm4-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1826611.924	6.2616	70.9327
H10-43-1920x1080-120-L-Auto-Std-H264-B-02-Rm4-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	102118346	8.0091	92.6722
H10-43-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	277743.5416	5.4436	40.4649
H10-43-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4	858965.8118	5.934	35.0526
H10-43-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	1316583.395	6.1194	51.1031
H10-43-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm1	1878061.726	6.2737	43.7266
H10-43-1920x1080-120-L-Auto-Std-H264-B-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	285078.768	5.455	55.3198
H10-43-1920x1080-120-L-Auto-Std-H264-B-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	766275.4962	5.8844	35.7513
H10-43-1920x1080-120-L-Auto-Std-H264-B-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	6869740.505	6.8369	56.1252
H10-43-1920x1080-120-L-Auto-Std-H264-B-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4	36659305.01	7.5642	72.6802
H10-43-1920x1080-120-L-Auto-Std-H264-B-07-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	5093.7635	3.707	18.2012
H10-43-1920x1080-120-L-Auto-Std-H264-B-07-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	107482.0501	5.0313	24.3132
H10-43-1920x1080-120-L-Auto-Std-H264-B-08-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1171694.146	6.0688	43.1339
H10-43-1920x1080-120-L-Auto-Std-H264-B-08-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	92187848.62	7.9647	94.5728
H10-43-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2049887.811	6.3117	66.4369
H10-43-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	129775395.8	8.1132	97.2578
H10-43-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1043843.345	6.0186	63.4509
H10-43-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	36637695.92	7.5639	70.104
H10-43-1920x1080-120-L-Auto-Std-H264-C-01-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	65968.7664	4.8193	23.477
H10-43-1920x1080-120-L-Auto-Std-H264-C-01-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2905251.848	6.4632	73.613
H10-43-1920x1080-120-L-Auto-Std-H264-C-02-Rm4-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	69900.4806	4.8445	26.1081
H10-43-1920x1080-120-L-Auto-Std-H264-C-02-Rm4-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2292484.805	6.3603	75.6302
H10-43-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	38577.281	4.5863	22.3346

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H10-43-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	406072.0154	5.6086	46.0083
H10-43-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	259801.7743	5.4146	43.7622
H10-43-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	2978104.841	6.4739	56.8589
H10-43-1920x1080-120-L-Auto-Std-H264-C-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	53677.6966	4.7298	38.97
H10-43-1920x1080-120-L-Auto-Std-H264-C-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm3	587112.2134	5.7687	60.7578
H10-43-1920x1080-120-L-Auto-Std-H264-C-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	475175.513	5.6769	52.4985
H10-43-1920x1080-120-L-Auto-Std-H264-C-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	26503616.26	7.4233	75.0001
H10-43-1920x1080-120-L-Auto-Std-H264-C-07-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm3	3910.7602	3.5923	20.7982
H10-43-1920x1080-120-L-Auto-Std-H264-C-07-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	14833.7051	4.1712	25.4785
H10-43-1920x1080-120-L-Auto-Std-H264-C-08-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	64466.8606	4.8093	28.9363
H10-43-1920x1080-120-L-Auto-Std-H264-C-08-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2448906.346	6.389	59.6015
H10-43-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	71665.4775	4.8553	26.7867
H10-43-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	5652425.988	6.7522	87.9031
H10-43-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	91563.919	4.9617	29.9248
H10-43-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1287781.761	6.1098	53.9813
H10-60-1920x1080-120-L-Auto-Std-H264-B-01-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	30332.2647	4.4819	40.827
H10-60-1920x1080-120-L-Auto-Std-H264-B-01-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	3945436.968	6.5961	50.212
H10-60-1920x1080-120-L-Auto-Std-H264-B-02-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	160754.1935	5.2062	35.8167
H10-60-1920x1080-120-L-Auto-Std-H264-B-02-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	9136360.127	6.9608	44.1934
H10-60-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	657528.6806	5.8179	39.2558
H10-60-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4	2581490.784	6.4119	46.2645
H10-60-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm1	981741.7378	5.992	28.9488
H10-60-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm1	3605940.847	6.557	48.4735
H10-60-1920x1080-120-L-Auto-Std-H264-B-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	4959147.184	6.6954	60.1739
H10-60-1920x1080-120-L-Auto-Std-H264-B-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4	41999546.24	7.6232	88.676
H10-60-1920x1080-120-L-Auto-Std-H264-B-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	695432.6303	5.8423	45.0915
H10-60-1920x1080-120-L-Auto-Std-H264-B-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm4	10132196.52	7.0057	63.6517

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H10-60-1920x1080-120-L-Auto-Std-H264-B-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	2348374.07	6.3708	51.1807
H10-60-1920x1080-120-L-Auto-Std-H264-B-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	31100381.42	7.4928	57.0866
H10-60-1920x1080-120-L-Auto-Std-H264-B-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1052487.492	6.0222	64.4795
H10-60-1920x1080-120-L-Auto-Std-H264-B-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	122931338.3	8.0897	96.6894
H10-60-1920x1080-120-L-Auto-Std-H264-B-09-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	4277020.23	6.6311	42.5587
H10-60-1920x1080-120-L-Auto-Std-H264-B-09-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	29087097.71	7.4637	56.3481
H10-60-1920x1080-120-L-Auto-Std-H264-B-10-Rm4-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	2663146.82	6.4254	63.7597
H10-60-1920x1080-120-L-Auto-Std-H264-B-10-Rm4-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm2	22347049.15	7.3492	55.7004
H10-60-1920x1080-120-L-Auto-Std-H264-C-01-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	45393.9883	4.657	49.6881
H10-60-1920x1080-120-L-Auto-Std-H264-C-01-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	239674.5023	5.3796	45.1063
H10-60-1920x1080-120-L-Auto-Std-H264-C-02-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	65876.4064	4.8187	45.0911
H10-60-1920x1080-120-L-Auto-Std-H264-C-02-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	1233384.537	6.0911	53.0737
H10-60-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	121223.3032	5.0836	45.0064
H10-60-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	898673.5641	5.9536	30.6161
H10-60-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	307553.684	5.4879	43.1194
H10-60-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX43-Rm1	2900822.929	6.4625	31.0318
H10-60-1920x1080-120-L-Auto-Std-H264-C-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	233138.2909	5.3676	41.06
H10-60-1920x1080-120-L-Auto-Std-H264-C-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	8864462.723	6.9477	41.1077
H10-60-1920x1080-120-L-Auto-Std-H264-C-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	98967.8908	4.9955	43.12
H10-60-1920x1080-120-L-Auto-Std-H264-C-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	3212272.349	6.5068	49.4541
H10-60-1920x1080-120-L-Auto-Std-H264-C-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	129872.1208	5.1135	38.7781
H10-60-1920x1080-120-L-Auto-Std-H264-C-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	11695063.76	7.068	68.2935
H10-60-1920x1080-120-L-Auto-Std-H264-C-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	87517.575	4.9421	31.5616
H10-60-1920x1080-120-L-Auto-Std-H264-C-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	3489450.736	6.5428	73.1534
H10-60-1920x1080-120-L-Auto-Std-H264-C-09-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	360716.669	5.5572	52.8677
H10-60-1920x1080-120-L-Auto-Std-H264-C-09-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm1	18117975.01	7.2581	73.3433
H10-60-1920x1080-120-L-Auto-Std-H264-C-10-Rm4-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	123926.2769	5.0932	41.3544

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H10-60-1920x1080-120-L-Auto-Std-H264-C-10-Rm4-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H10-snXX60-Rm2	4693365.307	6.6715	63.3054
H6-56-1920x1080-120-L-Auto-NA-NA-B-01-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm3	52572.8817	4.7208	48.9906
H6-56-1920x1080-120-L-Auto-NA-NA-B-01-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm3	78771.8033	4.8964	43.6095
H6-56-1920x1080-120-L-Auto-NA-NA-B-02-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	137601.3268	5.1386	40.7215
H6-56-1920x1080-120-L-Auto-NA-NA-B-02-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	224104.5984	5.3505	47.038
H6-56-1920x1080-120-L-Auto-NA-NA-B-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	432198.5027	5.6357	29.1916
H6-56-1920x1080-120-L-Auto-NA-NA-B-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	599478.4758	5.7778	33.2134
H6-56-1920x1080-120-L-Auto-NA-NA-B-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	988417.2844	5.9949	85.7035
H6-56-1920x1080-120-L-Auto-NA-NA-B-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1426840.093	6.1544	86.9684
H6-56-1920x1080-120-L-Auto-NA-NA-B-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	95908.245	4.9819	66.0829
H6-56-1920x1080-120-L-Auto-NA-NA-B-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	225984.5212	5.3541	75.5647
H6-56-1920x1080-120-L-Auto-NA-NA-B-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1369986.979	6.1367	73.9135
H6-56-1920x1080-120-L-Auto-NA-NA-B-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1655048.739	6.2188	66.4634
H6-56-1920x1080-120-L-Auto-NA-NA-B-07-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1543643.048	6.1885	86.3787
H6-56-1920x1080-120-L-Auto-NA-NA-B-07-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1060810.68	6.0256	80.3524
H6-56-1920x1080-120-L-Auto-NA-NA-B-08-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1014045.422	6.0061	74.0738
H6-56-1920x1080-120-L-Auto-NA-NA-B-08-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1293374.546	6.1117	76.6435
H6-56-1920x1080-120-L-Auto-NA-NA-B-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	305988.2325	5.4857	86.4339
H6-56-1920x1080-120-L-Auto-NA-NA-B-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	538812.858	5.7314	89.7592
H6-56-1920x1080-120-L-Auto-NA-NA-B-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	284537.1675	5.4541	85.4465
H6-56-1920x1080-120-L-Auto-NA-NA-B-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	366073.4258	5.5636	87.7197
H6-56-1920x1080-120-L-Auto-NA-NA-C-01-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	693729.0683	5.8412	65.759
H6-56-1920x1080-120-L-Auto-NA-NA-C-01-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1138319.523	6.0563	74.8667
H6-56-1920x1080-120-L-Auto-NA-NA-C-02-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	751425.1963	5.8759	56.8296
H6-56-1920x1080-120-L-Auto-NA-NA-C-02-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	306726.2689	5.4868	36.2788
H6-56-1920x1080-120-L-Auto-NA-NA-C-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	611568.6473	5.7864	43.4536
H6-56-1920x1080-120-L-Auto-NA-NA-C-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	353619.5604	5.5485	52.3093

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H6-56-1920x1080-120-L-Auto-NA-NA-C-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	959355.9974	5.982	62.4857
H6-56-1920x1080-120-L-Auto-NA-NA-C-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	283830.1707	5.4531	34.4679
H6-56-1920x1080-120-L-Auto-NA-NA-C-05-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	2153937.234	6.3332	94.2104
H6-56-1920x1080-120-L-Auto-NA-NA-C-05-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1488671.408	6.1728	89.6843
H6-56-1920x1080-120-L-Auto-NA-NA-C-06-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	530998.5314	5.7251	43.6142
H6-56-1920x1080-120-L-Auto-NA-NA-C-06-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	373043.6601	5.5718	47.2891
H6-56-1920x1080-120-L-Auto-NA-NA-C-07-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	165186.5983	5.218	32.3301
H6-56-1920x1080-120-L-Auto-NA-NA-C-07-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	105406.174	5.0229	38.2083
H6-56-1920x1080-120-L-Auto-NA-NA-C-08-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm3	156341.1467	5.1941	35.2385
H6-56-1920x1080-120-L-Auto-NA-NA-C-08-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	97578.4234	4.9894	37.5075
H6-56-1920x1080-120-L-Auto-NA-NA-C-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	792516.9542	5.899	87.871
H6-56-1920x1080-120-L-Auto-NA-NA-C-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	391714.6855	5.593	75.2265
H6-56-1920x1080-120-L-Auto-NA-NA-C-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	328662.3836	5.5168	74.8221
H6-56-1920x1080-120-L-Auto-NA-NA-C-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	160161.9576	5.2046	61.4586
H6-63-1920x1080-120-L-Auto-NA-NA-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm1	1026265.421	6.0113	41.2751
H6-63-1920x1080-120-L-Auto-NA-NA-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm1	973055.0769	5.9881	41.824
H6-63-1920x1080-120-L-Auto-NA-NA-B-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	1001587.753	6.0007	55.3566
H6-63-1920x1080-120-L-Auto-NA-NA-B-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	804815.0072	5.9057	46.6821
H6-63-1920x1080-120-L-Auto-NA-NA-B-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm1	353376.5341	5.5482	31.4138
H6-63-1920x1080-120-L-Auto-NA-NA-B-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm1	291141.049	5.4641	27.0728
H6-63-1920x1080-120-L-Auto-NA-NA-B-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	884215.8589	5.9466	38.3883
H6-63-1920x1080-120-L-Auto-NA-NA-B-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	867522.9635	5.9383	34.7668
H6-63-1920x1080-120-L-Auto-NA-NA-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	2368076.972	6.3744	56.5187
H6-63-1920x1080-120-L-Auto-NA-NA-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	2140197.446	6.3305	49.8472
H6-63-1920x1080-120-L-Auto-NA-NA-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	2077559.09	6.3176	54.4507
H6-63-1920x1080-120-L-Auto-NA-NA-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm2	1577773.763	6.198	45.2139
H6-63-1920x1080-120-L-Auto-NA-NA-B-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1827575.621	6.2619	65.7954

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H6-63-1920x1080-120-L-Auto-NA-NA-B-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1854292.031	6.2682	70.5877
H6-63-1920x1080-120-L-Auto-NA-NA-B-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	2081876.186	6.3185	59.5192
H6-63-1920x1080-120-L-Auto-NA-NA-B-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	2331774.852	6.3677	65.5648
H6-63-1920x1080-120-L-Auto-NA-NA-B-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	799762.2386	5.903	79.4694
H6-63-1920x1080-120-L-Auto-NA-NA-B-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	469324.0505	5.6715	70.635
H6-63-1920x1080-120-L-Auto-NA-NA-B-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	368061.6993	5.5659	74.0756
H6-63-1920x1080-120-L-Auto-NA-NA-B-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	307162.7801	5.4874	72.5129
H6-63-1920x1080-120-L-Auto-NA-NA-C-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	315671.0679	5.4992	72.6869
H6-63-1920x1080-120-L-Auto-NA-NA-C-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	313465.0218	5.4962	71.7281
H6-63-1920x1080-120-L-Auto-NA-NA-C-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	331122.8955	5.52	61.5564
H6-63-1920x1080-120-L-Auto-NA-NA-C-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	331634.3432	5.5207	59.7312
H6-63-1920x1080-120-L-Auto-NA-NA-C-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	320486.2582	5.5058	76.1099
H6-63-1920x1080-120-L-Auto-NA-NA-C-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	336459.4794	5.5269	76.2076
H6-63-1920x1080-120-L-Auto-NA-NA-C-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	104680.6851	5.0199	64.3242
H6-63-1920x1080-120-L-Auto-NA-NA-C-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	130277.1213	5.1149	66.4522
H6-63-1920x1080-120-L-Auto-NA-NA-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	365445.6886	5.5628	64.4018
H6-63-1920x1080-120-L-Auto-NA-NA-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	333417.2751	5.523	63.7614
H6-63-1920x1080-120-L-Auto-NA-NA-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	373619.393	5.5724	73.2215
H6-63-1920x1080-120-L-Auto-NA-NA-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	375832.5714	5.575	72.5248
H6-63-1920x1080-120-L-Auto-NA-NA-C-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	273563.506	5.4371	49.0148
H6-63-1920x1080-120-L-Auto-NA-NA-C-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	255440.7017	5.4073	47.5979
H6-63-1920x1080-120-L-Auto-NA-NA-C-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	331941.2919	5.5211	59.2943
H6-63-1920x1080-120-L-Auto-NA-NA-C-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX63-Rm1	319777.3177	5.5048	56.3122
H6-63-1920x1080-120-L-Auto-NA-NA-C-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	510736.3488	5.7082	47.0924
H6-63-1920x1080-120-L-Auto-NA-NA-C-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	599738.3441	5.778	54.5321
H6-63-1920x1080-120-L-Auto-NA-NA-C-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1075275.978	6.0315	75.4151
H6-63-1920x1080-120-L-Auto-NA-NA-C-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H6-snXX56-Rm4	1173851.8	6.0696	77.1086

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H7-29-1920x1080-120-L-Auto-NA-H264-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	10844831.39	7.0352	97.1251
H7-29-1920x1080-120-L-Auto-NA-H264-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	11511044.15	7.0611	98.1532
H7-29-1920x1080-120-L-Auto-NA-H264-B-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	5977560.274	6.7765	93.8892
H7-29-1920x1080-120-L-Auto-NA-H264-B-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	6361076.823	6.8035	96.5447
H7-29-1920x1080-120-L-Auto-NA-H264-B-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1508139.159	6.1784	68.0137
H7-29-1920x1080-120-L-Auto-NA-H264-B-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	3975336.217	6.5994	86.2895
H7-29-1920x1080-120-L-Auto-NA-H264-B-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	2669949.093	6.4265	54.0367
H7-29-1920x1080-120-L-Auto-NA-H264-B-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	6989479.233	6.8444	81.4483
H7-29-1920x1080-120-L-Auto-NA-H264-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	1356627.435	6.1325	63.3636
H7-29-1920x1080-120-L-Auto-NA-H264-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	1119279.546	6.0489	47.4782
H7-29-1920x1080-120-L-Auto-NA-H264-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	8505006.065	6.9297	96.6391
H7-29-1920x1080-120-L-Auto-NA-H264-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	5056873.872	6.7039	95.3775
H7-29-1920x1080-120-L-Auto-NA-H264-B-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	14334553.24	7.1564	76.9147
H7-29-1920x1080-120-L-Auto-NA-H264-B-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	18320987.36	7.2629	92.5432
H7-29-1920x1080-120-L-Auto-NA-H264-B-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	23530180.22	7.3716	77.6813
H7-29-1920x1080-120-L-Auto-NA-H264-B-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	18681809.12	7.2714	95.3554
H7-29-1920x1080-120-L-Auto-NA-H264-B-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	14400483.84	7.1584	69.8029
H7-29-1920x1080-120-L-Auto-NA-H264-B-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	41414525.68	7.6172	94.7739
H7-29-1920x1080-120-L-Auto-NA-H264-B-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	26362753.14	7.421	64.3921
H7-29-1920x1080-120-L-Auto-NA-H264-B-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	42401807.73	7.6274	94.6097
H7-29-1920x1080-120-L-Auto-NA-H264-C-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1668994.959	6.2225	54.2855
H7-29-1920x1080-120-L-Auto-NA-H264-C-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1414645.033	6.1506	50.1321
H7-29-1920x1080-120-L-Auto-NA-H264-C-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1124254.398	6.0509	56.3118
H7-29-1920x1080-120-L-Auto-NA-H264-C-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1221087.746	6.0867	60.6533
H7-29-1920x1080-120-L-Auto-NA-H264-C-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	366695.7497	5.5643	35.5658
H7-29-1920x1080-120-L-Auto-NA-H264-C-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	654585.3696	5.816	47.4355
H7-29-1920x1080-120-L-Auto-NA-H264-C-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	761103.8407	5.8814	54.974

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H7-29-1920x1080-120-L-Auto-NA-H264-C-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	807209.1292	5.907	45.7471
H7-29-1920x1080-120-L-Auto-NA-H264-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	611401.9365	5.7863	63.9695
H7-29-1920x1080-120-L-Auto-NA-H264-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	385727.1378	5.5863	66.8962
H7-29-1920x1080-120-L-Auto-NA-H264-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1846355.966	6.2663	63.384
H7-29-1920x1080-120-L-Auto-NA-H264-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	1311214.161	6.1177	52.4584
H7-29-1920x1080-120-L-Auto-NA-H264-C-07-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	545009.6693	5.7364	42.7008
H7-29-1920x1080-120-L-Auto-NA-H264-C-07-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	571515.0393	5.757	48.1034
H7-29-1920x1080-120-L-Auto-NA-H264-C-08-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	640657.9257	5.8066	46.3001
H7-29-1920x1080-120-L-Auto-NA-H264-C-08-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	515253.1743	5.712	38.0643
H7-29-1920x1080-120-L-Auto-NA-H264-C-09-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	684793.8126	5.8356	47.5841
H7-29-1920x1080-120-L-Auto-NA-H264-C-09-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	621794.8	5.7936	47.2304
H7-29-1920x1080-120-L-Auto-NA-H264-C-10-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	608397.8882	5.7842	40.1851
H7-29-1920x1080-120-L-Auto-NA-H264-C-10-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	711959.2839	5.8525	54.641
H7-82-1920x1080-120-L-Auto-NA-H264-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	124927.707	5.0967	36.624
H7-82-1920x1080-120-L-Auto-NA-H264-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	342306.0707	5.5344	49.5995
H7-82-1920x1080-120-L-Auto-NA-H264-B-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	72189.6229	4.8585	46.3958
H7-82-1920x1080-120-L-Auto-NA-H264-B-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	196027.562	5.2923	53.2838
H7-82-1920x1080-120-L-Auto-NA-H264-B-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	357886.9512	5.5537	87.4113
H7-82-1920x1080-120-L-Auto-NA-H264-B-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	426815.5322	5.6302	59.4274
H7-82-1920x1080-120-L-Auto-NA-H264-B-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	105076.5604	5.0215	37.9585
H7-82-1920x1080-120-L-Auto-NA-H264-B-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	439672.3077	5.6431	49.5285
H7-82-1920x1080-120-L-Auto-NA-H264-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	36225.406	4.559	75.6121
H7-82-1920x1080-120-L-Auto-NA-H264-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	45393.1162	4.657	74.0049
H7-82-1920x1080-120-L-Auto-NA-H264-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	154835.0996	5.1899	59.906
H7-82-1920x1080-120-L-Auto-NA-H264-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	470679.4024	5.6727	74.2324
H7-82-1920x1080-120-L-Auto-NA-H264-B-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	452702.6395	5.6558	64.7057
H7-82-1920x1080-120-L-Auto-NA-H264-B-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1237137.079	6.0924	79.413

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H7-82-1920x1080-120-L-Auto-NA-H264-B-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	164669.67	5.2166	61.2827
H7-82-1920x1080-120-L-Auto-NA-H264-B-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	299473.7698	5.4764	59.3831
H7-82-1920x1080-120-L-Auto-NA-H264-B-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	74247.5272	4.8707	56.9581
H7-82-1920x1080-120-L-Auto-NA-H264-B-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	102098.5619	5.009	34.7176
H7-82-1920x1080-120-L-Auto-NA-H264-B-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	48015.0433	4.6814	42.4327
H7-82-1920x1080-120-L-Auto-NA-H264-B-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	85986.0377	4.9344	40.9417
H7-82-1920x1080-120-L-Auto-NA-H264-C-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	40855.1514	4.6112	70.8823
H7-82-1920x1080-120-L-Auto-NA-H264-C-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	55811.7292	4.7467	79.8278
H7-82-1920x1080-120-L-Auto-NA-H264-C-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	13766.0425	4.1388	54.2935
H7-82-1920x1080-120-L-Auto-NA-H264-C-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	18974.6309	4.2782	46.7124
H7-82-1920x1080-120-L-Auto-NA-H264-C-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	27047.1542	4.4321	61.6803
H7-82-1920x1080-120-L-Auto-NA-H264-C-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	39604.3216	4.5977	61.9922
H7-82-1920x1080-120-L-Auto-NA-H264-C-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	35241.0534	4.547	74.3213
H7-82-1920x1080-120-L-Auto-NA-H264-C-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	41681.1442	4.6199	49.9504
H7-82-1920x1080-120-L-Auto-NA-H264-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	88446.2026	4.9467	94.0744
H7-82-1920x1080-120-L-Auto-NA-H264-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	80414.1453	4.9053	95.1222
H7-82-1920x1080-120-L-Auto-NA-H264-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	27570.491	4.4404	64.9574
H7-82-1920x1080-120-L-Auto-NA-H264-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	53806.3068	4.7308	82.91
H7-82-1920x1080-120-L-Auto-NA-H264-C-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	45730.2085	4.6602	71.9945
H7-82-1920x1080-120-L-Auto-NA-H264-C-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	44654.7981	4.6499	48.8513
H7-82-1920x1080-120-L-Auto-NA-H264-C-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	31574.4593	4.4993	76.0272
H7-82-1920x1080-120-L-Auto-NA-H264-C-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	42073.9437	4.624	69.942
H7-82-1920x1080-120-L-Auto-NA-H264-C-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	15775.379	4.198	48.8938
H7-82-1920x1080-120-L-Auto-NA-H264-C-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	33819.7221	4.5292	70.6521
H7-82-1920x1080-120-L-Auto-NA-H264-C-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	14020.3631	4.1468	57.2809
H7-82-1920x1080-120-L-Auto-NA-H264-C-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	14753.6355	4.1689	46.5666
H8-35-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	3285501.678	6.5166	56.4792

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H8-35-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4	4236992.433	6.6271	57.9396
H8-35-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4	368250.7864	5.5661	38.7309
H8-35-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4	1702354.335	6.231	69.8476
H8-35-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	1019077.596	6.0082	45.5645
H8-35-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm4	1294775.31	6.1122	48.5522
H8-35-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm4	1610586.557	6.207	65.807
H8-35-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm4	386333.2385	5.587	34.241
H8-35-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	19326.163	4.2861	22.6415
H8-35-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm1	19580.8221	4.2918	24.0993
H8-35-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	655263.2347	5.8164	40.2992
H8-35-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	2909847.072	6.4639	69.9497
H8-35-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	10024830.5	7.0011	83.0987
H8-35-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	5297145.219	6.724	55.4038
H8-35-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm4	2516540.745	6.4008	40.306
H8-35-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4	11798999.88	7.0718	81.6967
H8-35-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm4	2590990.318	6.4135	39.2043
H8-35-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX35-Rm4	11123306.42	7.0462	61.4451
H8-35-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	2729319.555	6.4361	53.1869
H8-35-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	7887589.804	6.8969	55.0262
H8-35-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1294583.088	6.1121	55.7469
H8-35-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	9857758.338	6.9938	69.86
H8-35-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	136126.8894	5.1339	26.6284
H8-35-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	839478.1025	5.924	54.249
H8-35-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	930360.6468	5.9687	54.5132
H8-35-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm4	3436090.668	6.5361	61.4742
H8-35-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1860214.131	6.2696	77.091
H8-35-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm4	1036939.684	6.0158	39.4014

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H8-35-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	9441.7854	3.9751	23.252
H8-35-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	8166.4143	3.912	22.4755
H8-35-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1056417.711	6.0238	87.9956
H8-35-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	626078.7931	5.7966	59.1119
H8-35-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	2733060.111	6.4366	78.15
H8-35-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	7484191.4	6.8741	57.4614
H8-35-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	969412.8254	5.9865	32.3612
H8-35-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	23589501.54	7.3727	84.349
H8-35-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1529310.512	6.1845	54.7791
H8-35-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	30443149.71	7.4835	85.8479
H8-35-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1028288.239	6.0121	45.704
H8-35-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	10255282.87	7.0109	69.3122
H8-61-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1679638.567	6.2252	55.3157
H8-61-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	1365770.347	6.1354	61.9033
H8-61-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	885536.1745	5.9472	57.0948
H8-61-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	330533.0054	5.5192	37.9989
H8-61-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	395434.4156	5.5971	30.3091
H8-61-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	1280476.603	6.1074	73.7345
H8-61-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	773860.5676	5.8887	72.0351
H8-61-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	161872.5413	5.2092	39.7993
H8-61-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	4091251.294	6.6119	55.7961
H8-61-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1206570.969	6.0816	81.5521
H8-61-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	695916.9025	5.8426	52.8791
H8-61-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	647497.2131	5.8112	70.7369
H8-61-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	1039783.4	6.0169	64.2468
H8-61-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	599040.4834	5.7775	68.5348
H8-61-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	1295834.346	6.1125	74.4041

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H8-61-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	1002290.042	6.001	79.705
H8-61-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	797569.2751	5.9018	40.3331
H8-61-1920x1080-120-L-Auto-Std-H264-B-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	2946099.284	6.4692	72.1544
H8-61-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	651920.6397	5.8142	43.1548
H8-61-1920x1080-120-L-Auto-Std-H264-B-10-Rm3-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	1461813.064	6.1649	64.0643
H8-61-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	3643474.649	6.5615	79.2645
H8-61-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1934328.18	6.2865	83.6153
H8-61-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	574353.8868	5.7592	67.2217
H8-61-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	315777.39	5.4994	62.3671
H8-61-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1679729.665	6.2252	67.6717
H8-61-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1045506.319	6.0193	81.5993
H8-61-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	119070.331	5.0758	39.7237
H8-61-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm2	67277.1638	4.8279	38.8846
H8-61-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	434117.2663	5.6376	51.0505
H8-61-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	352955.0397	5.5477	41.808
H8-61-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	413449.5526	5.6164	52.2953
H8-61-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	457993.3227	5.6609	63.7955
H8-61-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	1905362.019	6.28	68.1452
H8-61-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	756231.1633	5.8787	55.7348
H8-61-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	2417230.1	6.3833	75.0104
H8-61-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1500580.064	6.1763	63.3069
H8-61-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	3916668.887	6.5929	73.8698
H8-61-1920x1080-120-L-Auto-Std-H264-C-09-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1434164.088	6.1566	84.0432
H8-61-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	2518649.755	6.4012	71.6721
H8-61-1920x1080-120-L-Auto-Std-H264-C-10-Rm3-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	670128.6176	5.8262	69.4601
H9-09-1920x1080-120-L-Auto-Std-H264-B-01-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	998923.0362	5.9995	44.8257
H9-09-1920x1080-120-L-Auto-Std-H264-B-01-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	6316236.03	6.8005	39.1464

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H9-09-1920x1080-120-L-Auto-Std-H264-B-02-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	2289986.227	6.3598	84.6155
H9-09-1920x1080-120-L-Auto-Std-H264-B-02-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	16372246.24	7.2141	94.651
H9-09-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	13905.1055	4.1432	20.5058
H9-09-1920x1080-120-L-Auto-Std-H264-B-03-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	35836.0824	4.5543	30.9131
H9-09-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	88322.6964	4.9461	42.1444
H9-09-1920x1080-120-L-Auto-Std-H264-B-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	132747.798	5.123	51.8979
H9-09-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	469161.6644	5.6713	48.7367
H9-09-1920x1080-120-L-Auto-Std-H264-B-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1661524.44	6.2205	50.9023
H9-09-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	470047.4789	5.6721	40.84
H9-09-1920x1080-120-L-Auto-Std-H264-B-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	1194208.029	6.0771	36.9285
H9-09-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	1200925.772	6.0795	33.5856
H9-09-1920x1080-120-L-Auto-Std-H264-B-07-Rm4-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	7648115.623	6.8836	56.1931
H9-09-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	1992906.994	6.2995	60.3551
H9-09-1920x1080-120-L-Auto-Std-H264-B-08-Rm4-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX09-Rm3	38591510.21	7.5865	88.803
H9-09-1920x1080-120-L-Auto-Std-H264-B-09-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	164723.0221	5.2168	51.4708
H9-09-1920x1080-120-L-Auto-Std-H264-B-09-Rm1-d-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	77617.43	4.89	41.6316
H9-09-1920x1080-120-L-Auto-Std-H264-B-10-Rm1-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	451343.5698	5.6545	73.0784
H9-09-1920x1080-120-L-Auto-Std-H264-B-10-Rm1-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	2298707.924	6.3615	94.6479
H9-09-1920x1080-120-L-Auto-Std-H264-C-01-Rm3-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	963581.7271	5.9839	86.5447
H9-09-1920x1080-120-L-Auto-Std-H264-C-01-Rm3-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	5334486.322	6.7271	95.7243
H9-09-1920x1080-120-L-Auto-Std-H264-C-02-Rm3-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	1757075.758	6.2448	80.1168
H9-09-1920x1080-120-L-Auto-Std-H264-C-02-Rm3-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm3	2174284.553	6.3373	64.8454
H9-09-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	18645.123	4.2706	39.9976
H9-09-1920x1080-120-L-Auto-Std-H264-C-03-Rm1-a-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	17326.3985	4.2387	37.7065
H9-09-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	33416.437	4.524	27.3836
H9-09-1920x1080-120-L-Auto-Std-H264-C-04-Rm1-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm2	31014.5512	4.4916	27.5696
H9-09-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	204195.2689	5.31	58.9402

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H9-09-1920x1080-120-L-Auto-Std-H264-C-05-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	285569.0036	5.4557	42.3788
H9-09-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	254720.7689	5.4061	55.5933
H9-09-1920x1080-120-L-Auto-Std-H264-C-06-Rm2-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	363532.6432	5.5605	55.4357
H9-09-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	2246423.793	6.3515	55.2144
H9-09-1920x1080-120-L-Auto-Std-H264-C-07-Rm4-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	17246619.41	7.2367	93.8058
H9-09-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	4554366.843	6.6584	88.7275
H9-09-1920x1080-120-L-Auto-Std-H264-C-08-Rm4-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	18492370.58	7.267	98.8327
H9-09-1920x1080-120-L-Auto-Std-H264-C-09-Rm1-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	28913.5479	4.4611	45.8911
H9-09-1920x1080-120-L-Auto-Std-H264-C-09-Rm1-d-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	58474.9104	4.767	32.1408
H9-09-1920x1080-120-L-Auto-Std-H264-C-10-Rm1-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	114947.1506	5.0605	27.5081
H9-09-1920x1080-120-L-Auto-Std-H264-C-10-Rm1-e-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	326901.5649	5.5144	57.4717
H9-63-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	68862.9416	4.838	73.0236
H9-63-1920x1080-120-L-Auto-Std-H264-B-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm2	83173.9289	4.92	46.5807
H9-63-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	31864.6647	4.5033	90.903
H9-63-1920x1080-120-L-Auto-Std-H264-B-02-Rm1-a-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	7488.8373	3.8744	34.0426
H9-63-1920x1080-120-L-Auto-Std-H264-B-03-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	1550.5146	3.1905	23.4095
H9-63-1920x1080-120-L-Auto-Std-H264-B-03-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2c]-Video-Samsung-Galaxy-S5-Android-442-snCG-indoor-20220203	11009.8075	4.0418	73.5319
H9-63-1920x1080-120-L-Auto-Std-H264-B-04-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	12042.8748	4.0807	78.7946
H9-63-1920x1080-120-L-Auto-Std-H264-B-04-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	6053.6157	3.782	40.391
H9-63-1920x1080-120-L-Auto-Std-H264-B-05-Rm4-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	7997265.199	6.9029	85.3806
H9-63-1920x1080-120-L-Auto-Std-H264-B-05-Rm4-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	46860565.83	7.6708	89.4903
H9-63-1920x1080-120-L-Auto-Std-H264-B-06-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	728984.6236	5.8627	83.5487
H9-63-1920x1080-120-L-Auto-Std-H264-B-06-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	2083589.929	6.3188	79.3407
H9-63-1920x1080-120-L-Auto-Std-H264-B-07-Rm3-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	94888.4697	4.9772	49.3832
H9-63-1920x1080-120-L-Auto-Std-H264-B-07-Rm3-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	374290.6585	5.5732	49.9233
H9-63-1920x1080-120-L-Auto-Std-H264-B-08-Rm3-d-pcm-L.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	11370.0499	4.0558	45.1754
H9-63-1920x1080-120-L-Auto-Std-H264-B-08-Rm3-d-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	13340.8111	4.1252	66.0807

Table 5. Continued

Test File	Most Consistent Reference Model	LR=	LLR=	S=
H9-63-1920x1080-120-L-Auto-Std-H264-B-09-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	32415.3905	4.5108	42.3053
H9-63-1920x1080-120-L-Auto-Std-H264-B-09-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm2	25357.1717	4.4041	28.7499
H9-63-1920x1080-120-L-Auto-Std-H264-B-10-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	2117307.91	6.3258	89.6229
H9-63-1920x1080-120-L-Auto-Std-H264-B-10-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H9-snXX63-Rm3	8625066.215	6.9358	97.1603
H9-63-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-Mate-20-Pro-Android-9-snPHBL	9438.5154	3.9749	40.7979
H9-63-1920x1080-120-L-Auto-Std-H264-C-01-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	22990.9026	4.3616	40.7942
H9-63-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	18989.7898	4.2785	78.4395
H9-63-1920x1080-120-L-Auto-Std-H264-C-02-Rm1-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	12344.2093	4.0915	87.1007
H9-63-1920x1080-120-L-Auto-Std-H264-C-03-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-Huawei-P30-Lite-Android-9-snPHBL	948.7494	2.9772	25.6772
H9-63-1920x1080-120-L-Auto-Std-H264-C-03-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	1669.6725	3.2226	33.2842
H9-63-1920x1080-120-L-Auto-Std-H264-C-04-Rm2-a-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20220203	6797.192	3.8323	38.8252
H9-63-1920x1080-120-L-Auto-Std-H264-C-04-Rm2-a-pcm-R.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	11436.7306	4.0583	79.5643
H9-63-1920x1080-120-L-Auto-Std-H264-C-05-Rm4-d-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H8-snXX61-Rm3	535484.7014	5.7287	59.2366
H9-63-1920x1080-120-L-Auto-Std-H264-C-05-Rm4-d-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	2246845.913	6.3516	57.1441
H9-63-1920x1080-120-L-Auto-Std-H264-C-06-Rm4-b-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm2	127432.1408	5.1053	31.1841
H9-63-1920x1080-120-L-Auto-Std-H264-C-06-Rm4-b-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	118605.909	5.0741	35.8574
H9-63-1920x1080-120-L-Auto-Std-H264-C-07-Rm3-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm4	20453.9788	4.3108	38.2013
H9-63-1920x1080-120-L-Auto-Std-H264-C-07-Rm3-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	93103.5416	4.969	39.8878
H9-63-1920x1080-120-L-Auto-Std-H264-C-08-Rm3-d-pcm-L.txt	[AAC-LC-v2-48kHz-128kbps-2m]-Video-Allview-E3-Living-Android-51-snCG-indoor-20100101	2243.1299	3.3509	28.831
H9-63-1920x1080-120-L-Auto-Std-H264-C-08-Rm3-d-pcm-R.txt	[AAC-LC-v1-44kHz-064kbps-2c]-Video-HTC-Evo-3D-snGAR	4736.511	3.6755	52.4006
H9-63-1920x1080-120-L-Auto-Std-H264-C-09-Rm1-c-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	6594.2234	3.8192	33.3511
H9-63-1920x1080-120-L-Auto-Std-H264-C-09-Rm1-c-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm2	8558.2361	3.9324	25.225
H9-63-1920x1080-120-L-Auto-Std-H264-C-10-Rm1-e-pcm-L.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX82-Rm1	1138802.514	6.0564	64.5966
H9-63-1920x1080-120-L-Auto-Std-H264-C-10-Rm1-e-pcm-R.txt	[AAC-LC-v2-48kHz-192kbps-2c]-Video-GoPro-H7-snXX29-Rm4	291804.8801	5.4651	40.825