

IVAS Input-Output Level Harmonization

STV Loudness across output formats

2026.03.25

IVAS Input-Output Loudness Harmonization

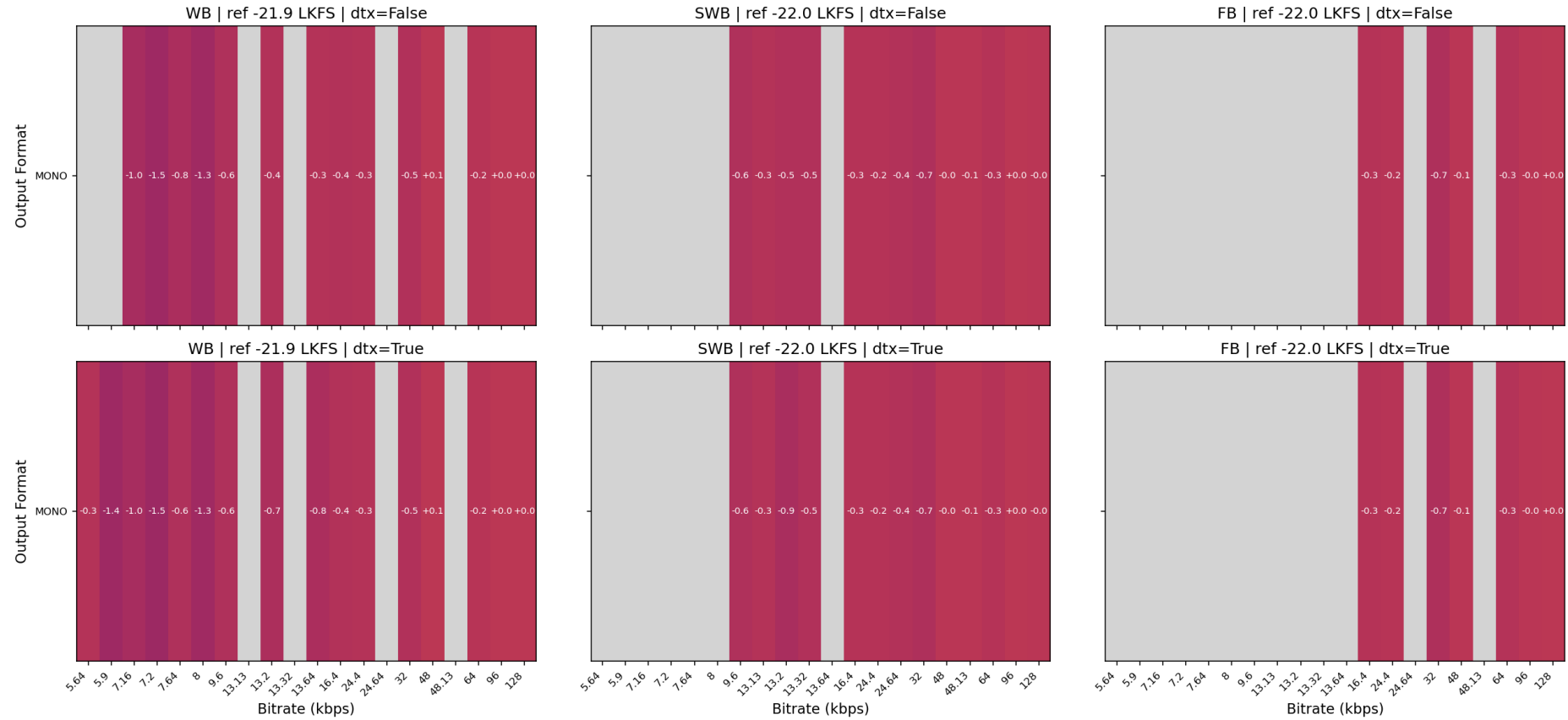
Overview of new results

- Pipeline link: <https://forge.3gpp.org/rep/ivas-codec-pc/ivas-codec/-/pipelines/74346>
- Triggered with STV for all input/output format combinations

IVAS Input-Output Loudness Harmonization

Mono

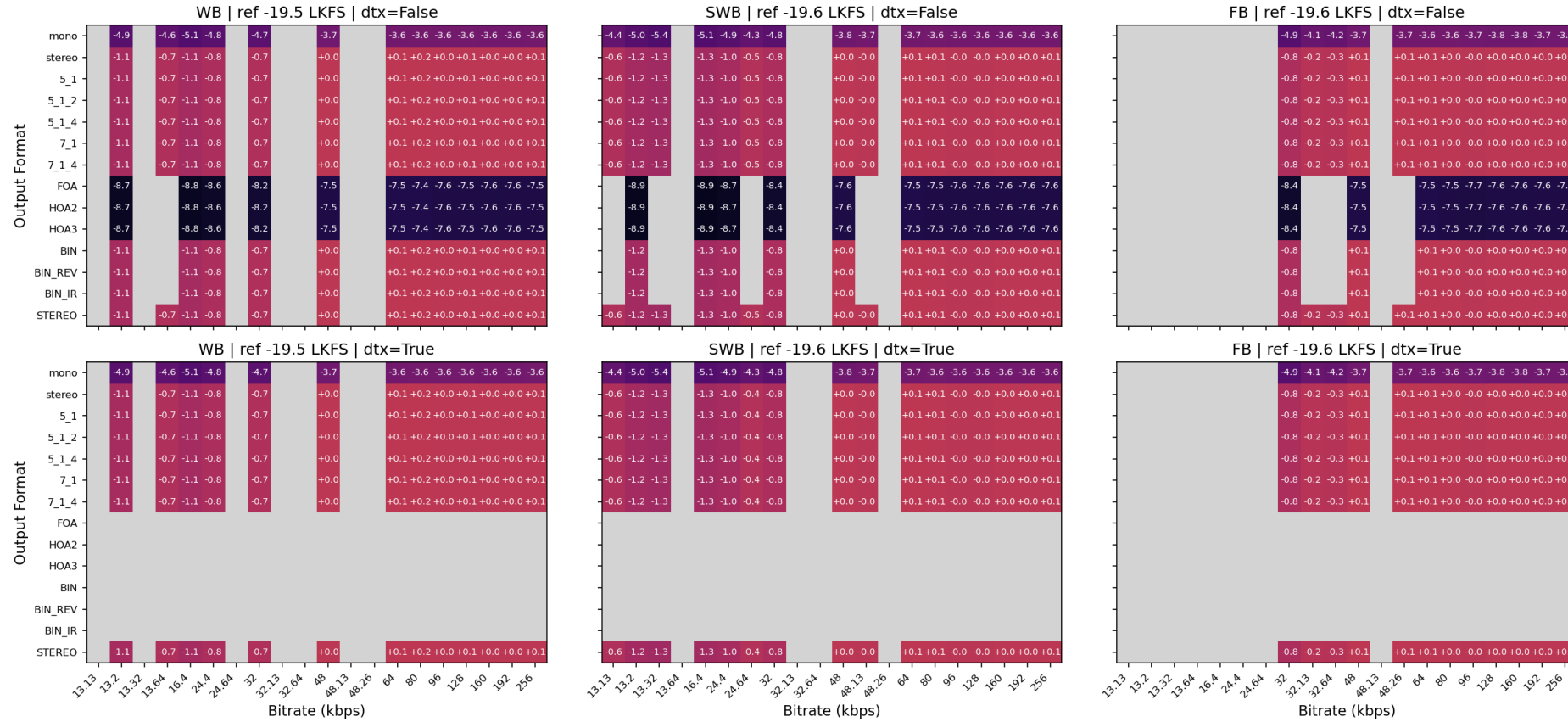
Output Loudness Heatmap across Bitrates: MONO



IVAS Input-Output Loudness Harmonization

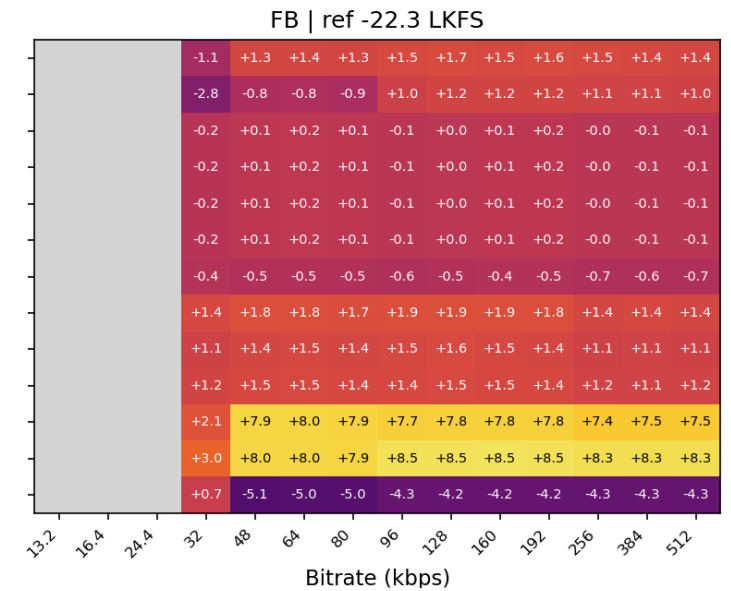
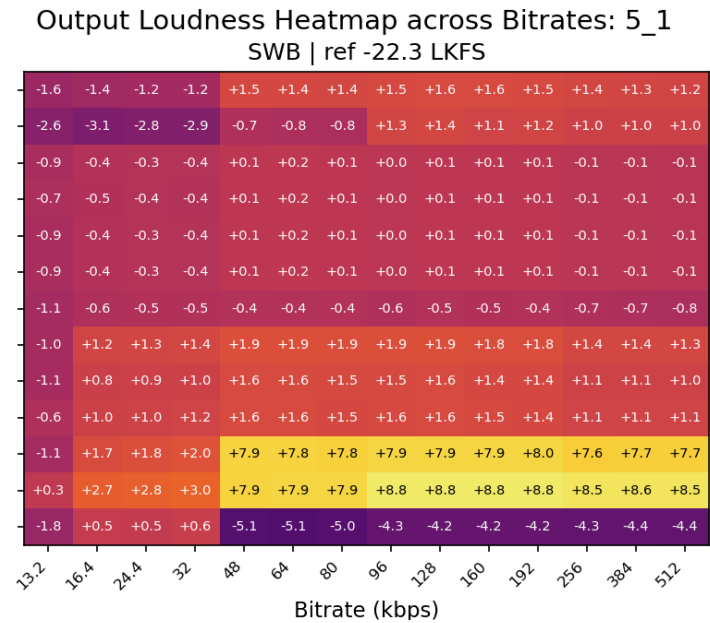
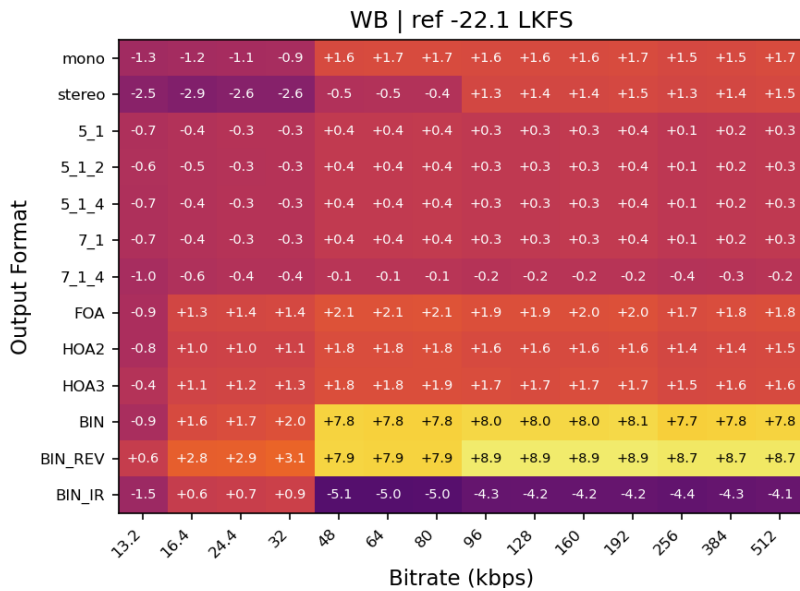
Stereo

Output Loudness Heatmap across Bitrates: STEREO



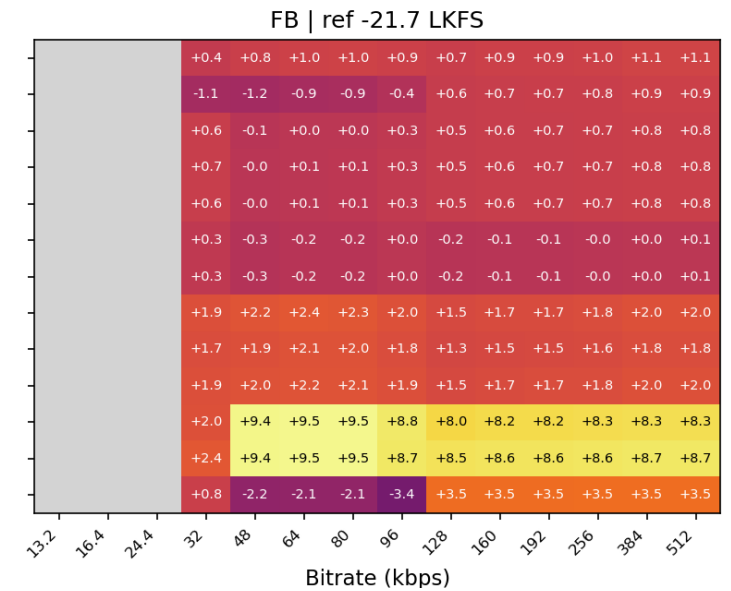
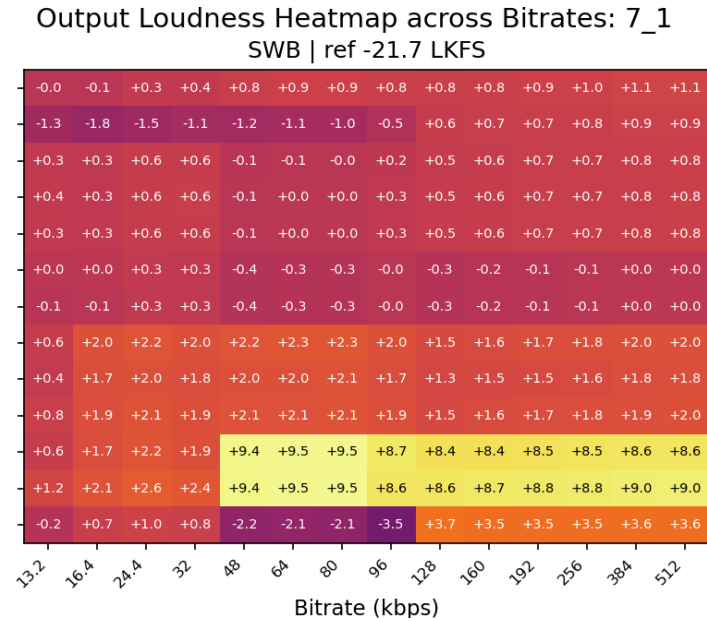
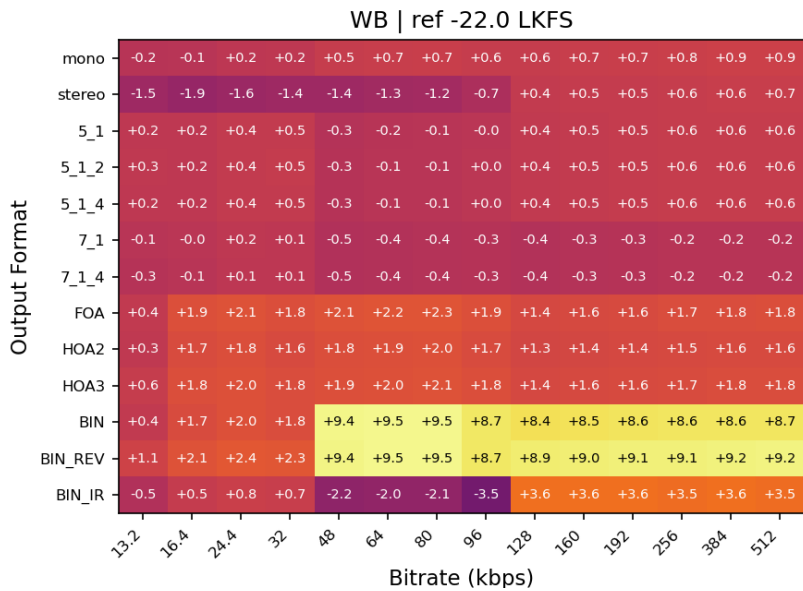
IVAS Input-Output Loudness Harmonization

5.1 (No TDREND)



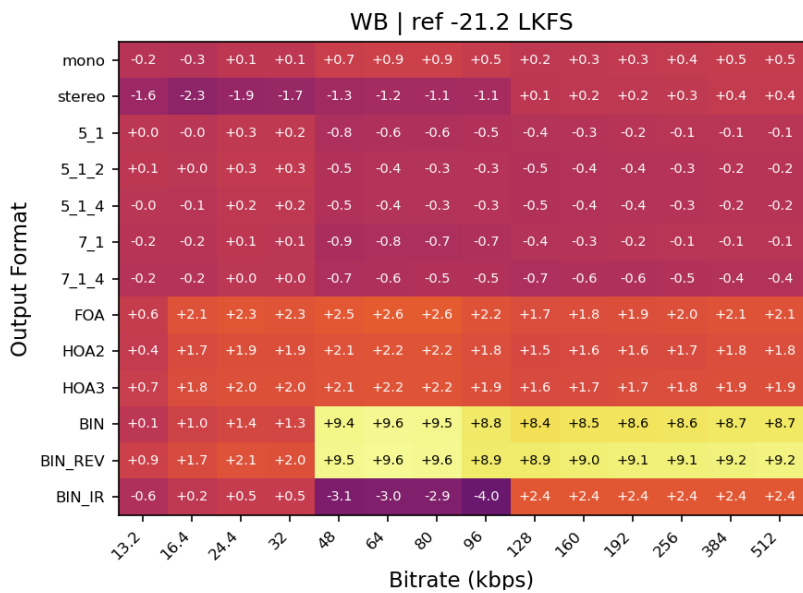
IVAS Input-Output Loudness Harmonization

7.1 (No TDREND)

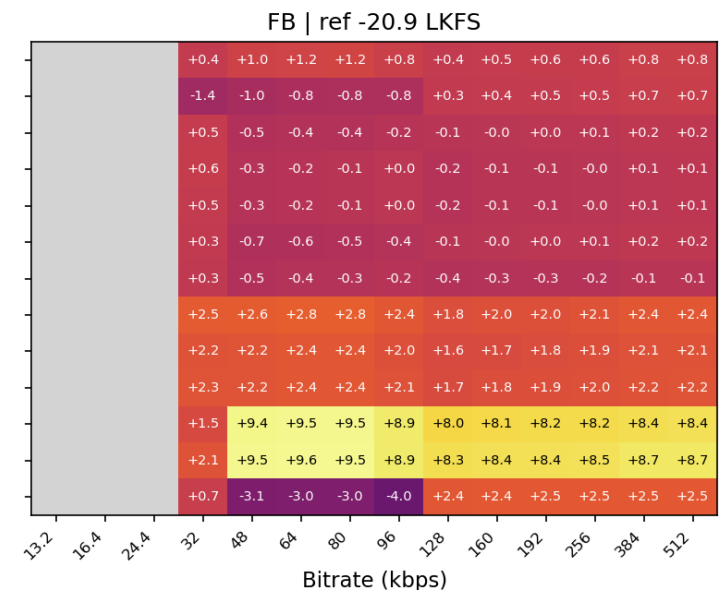
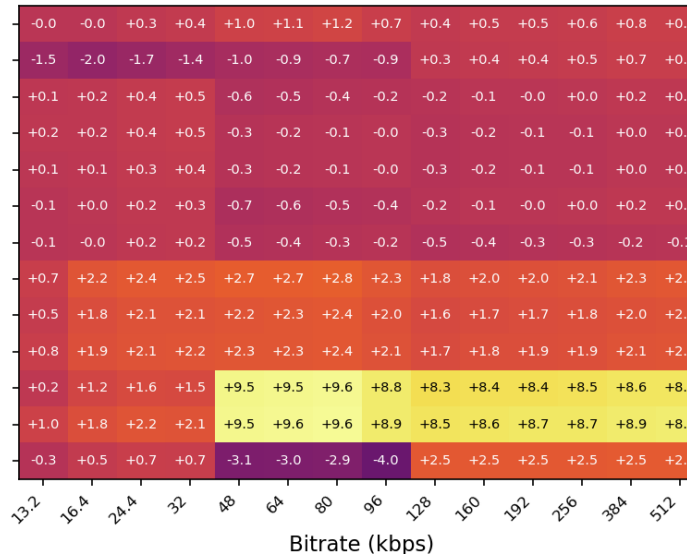


IVAS Input-Output Loudness Harmonization

5.1+2

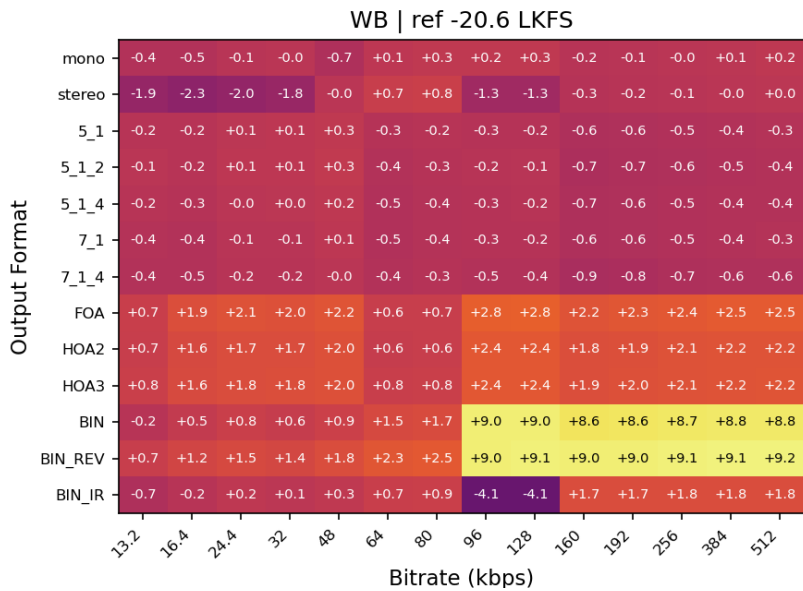


Output Loudness Heatmap across Bitrates: 5_1_2
SWB | ref -20.9 LKFS

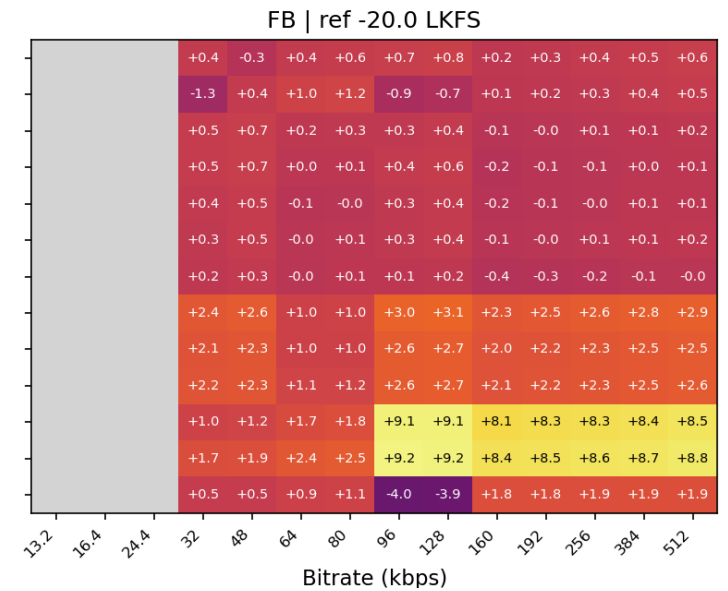
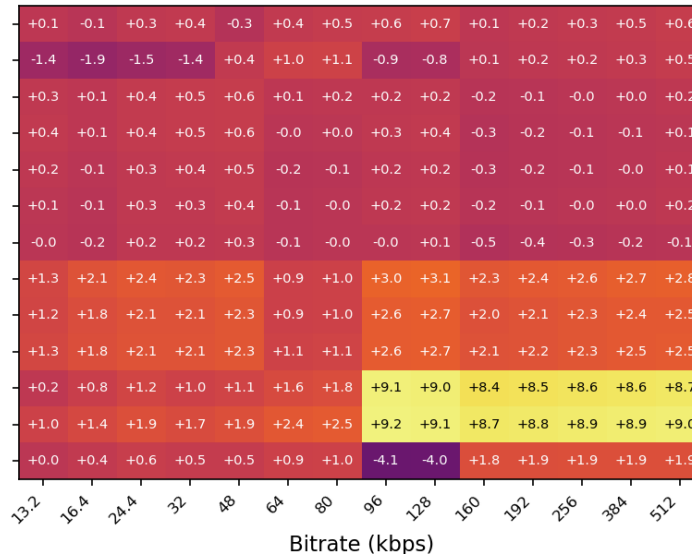


IVAS Input-Output Loudness Harmonization

5.1+4

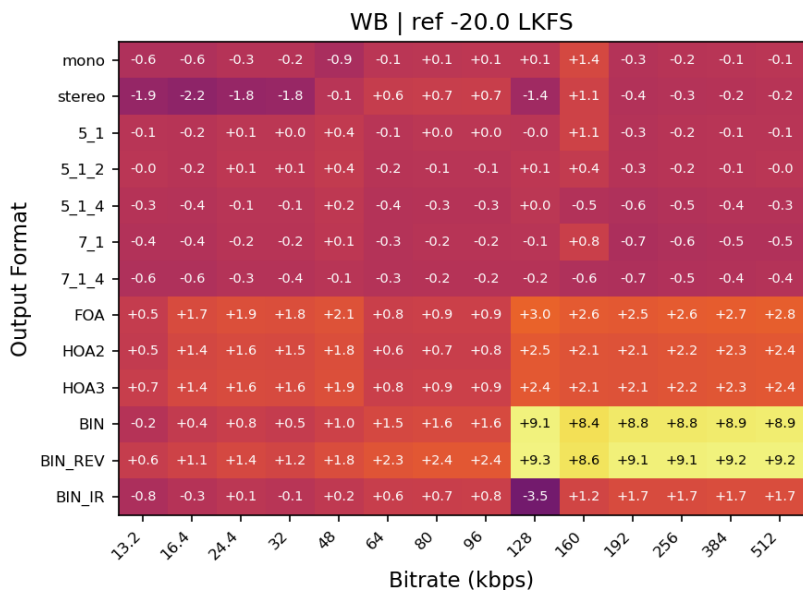


Output Loudness Heatmap across Bitrates: 5_1_4
SWB | ref -20.0 LKFS

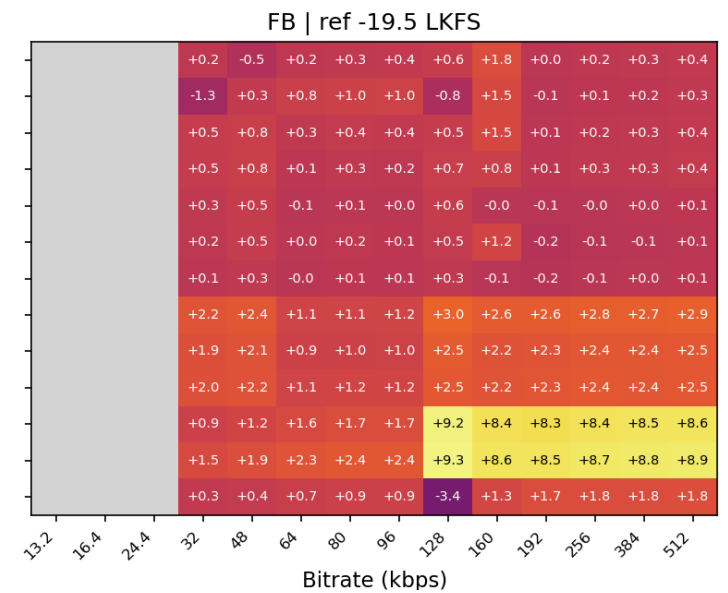
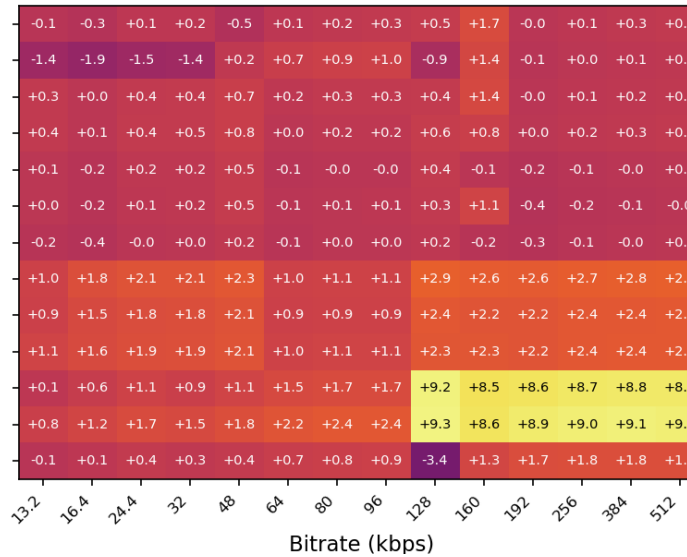


IVAS Input-Output Loudness Harmonization

7.1+4



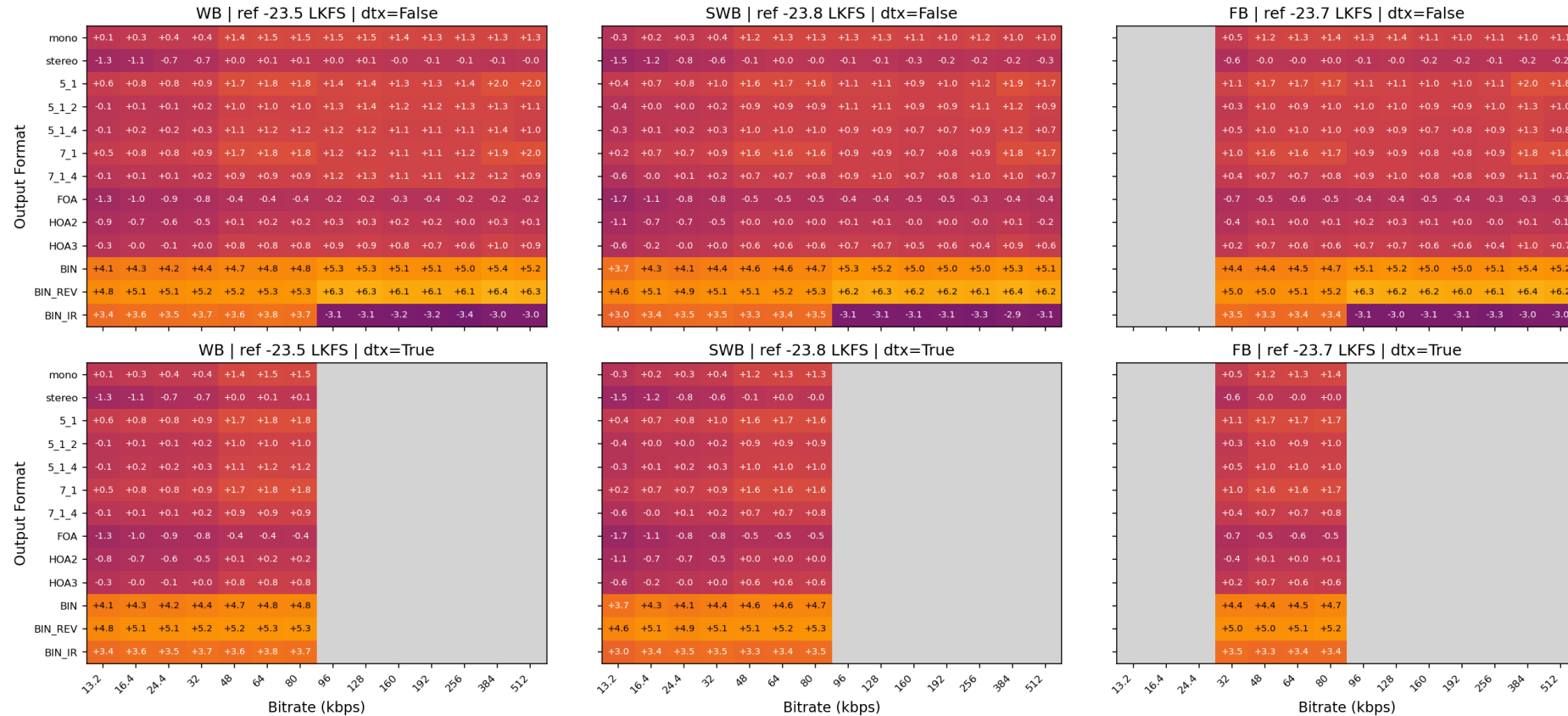
Output Loudness Heatmap across Bitrates: 7_1_4
SWB | ref -19.5 LKFS



IVAS Input-Output Loudness Harmonization

HOA2

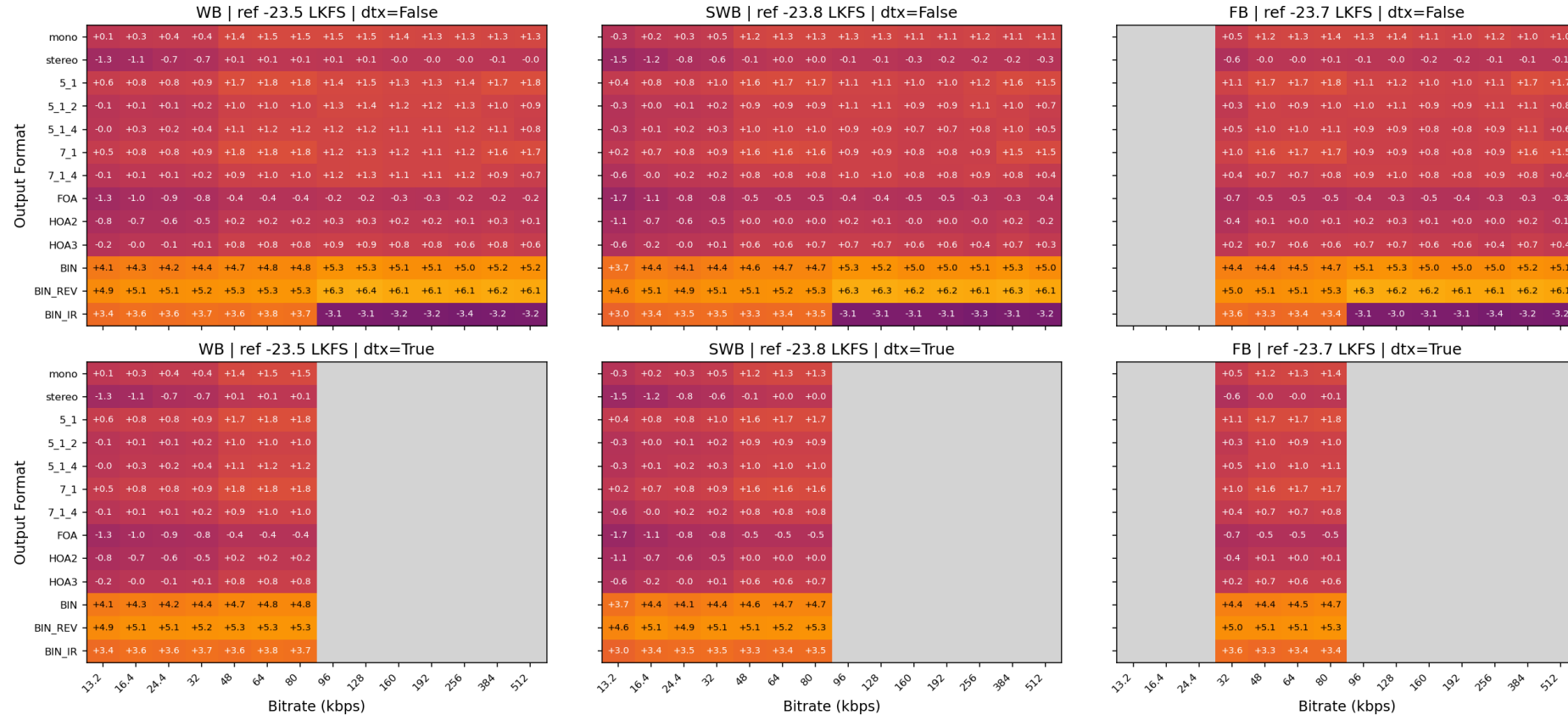
Output Loudness Heatmap across Bitrates: HOA2



IVAS Input-Output Loudness Harmonization

HOA3

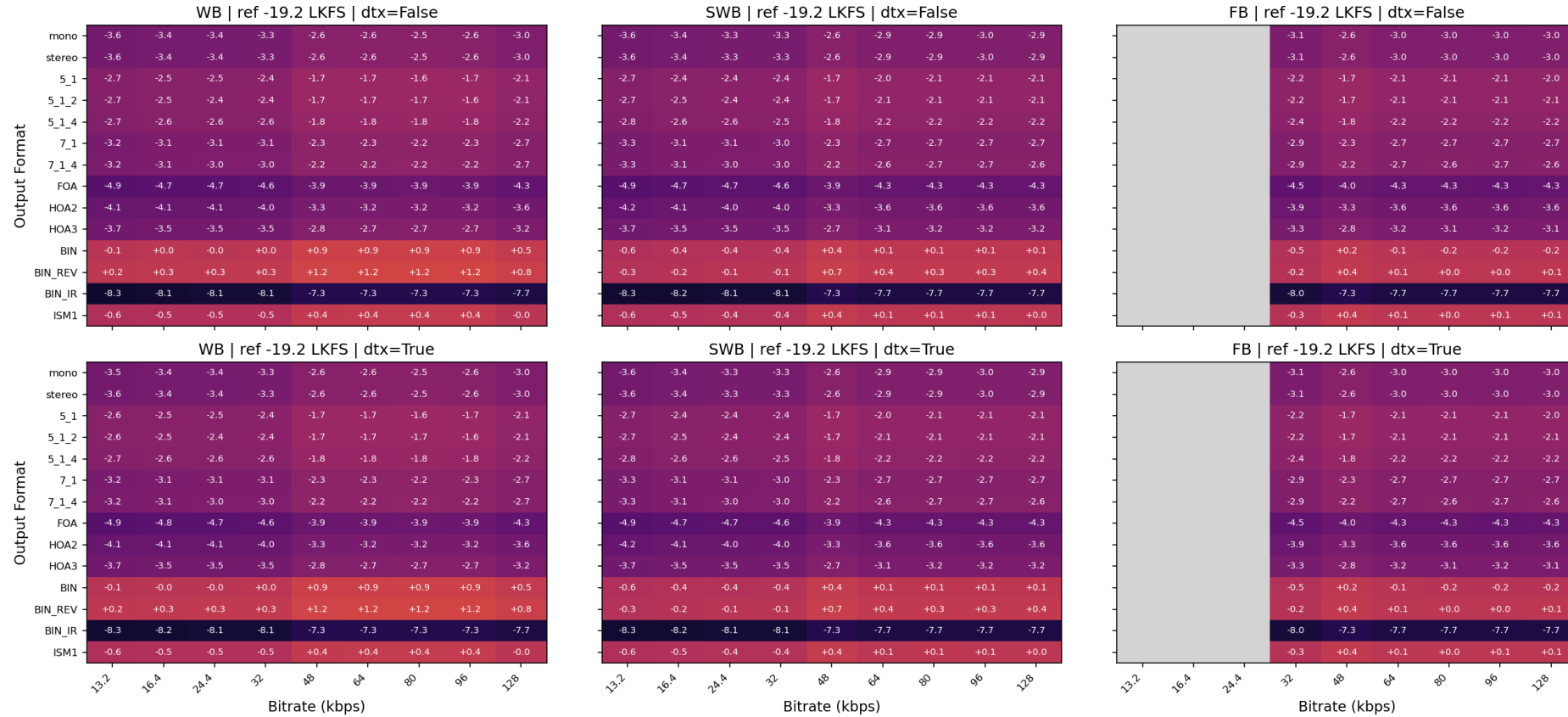
Output Loudness Heatmap across Bitrates: HOA3



IVAS Input-Output Loudness Harmonization

ISM1

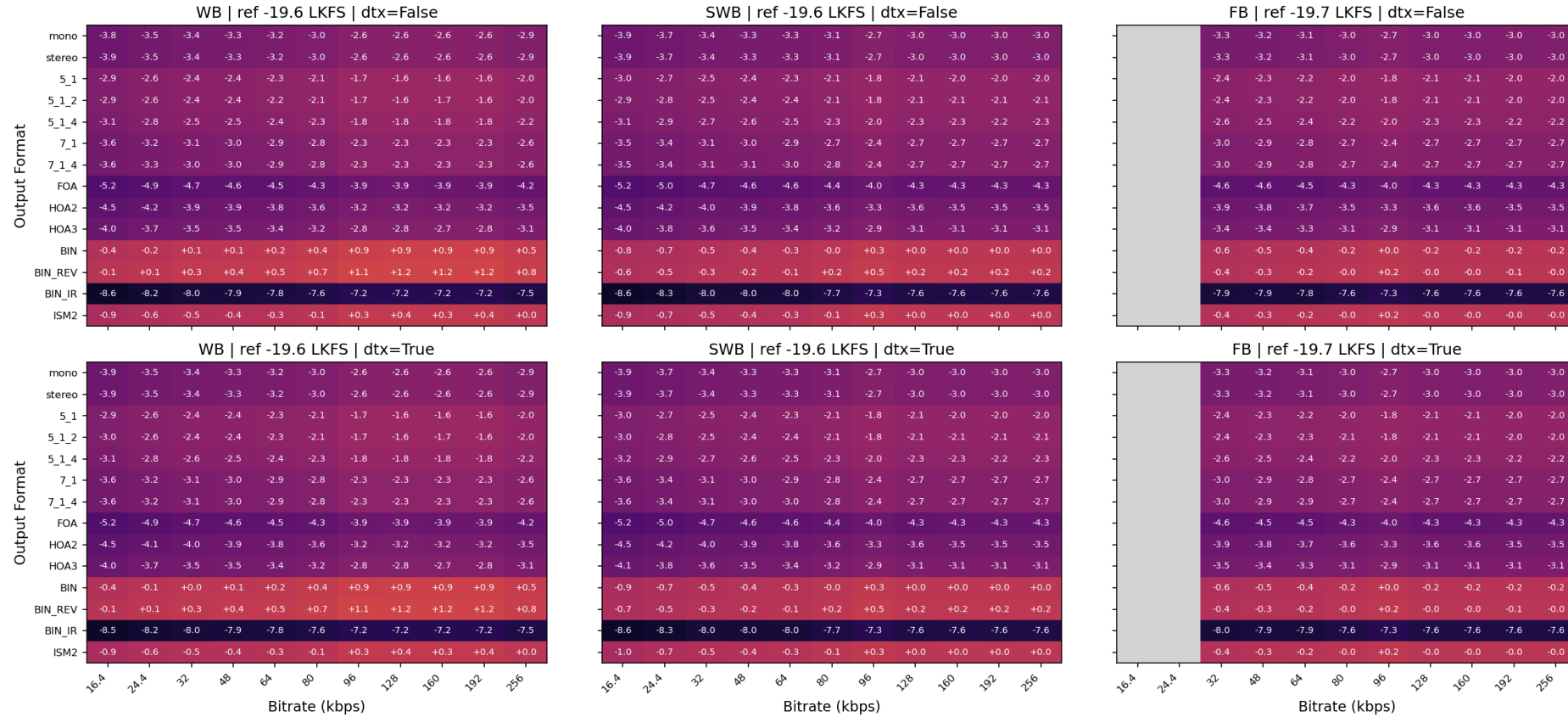
Output Loudness Heatmap across Bitrates: ISM1



IVAS Input-Output Loudness Harmonization

ISM2

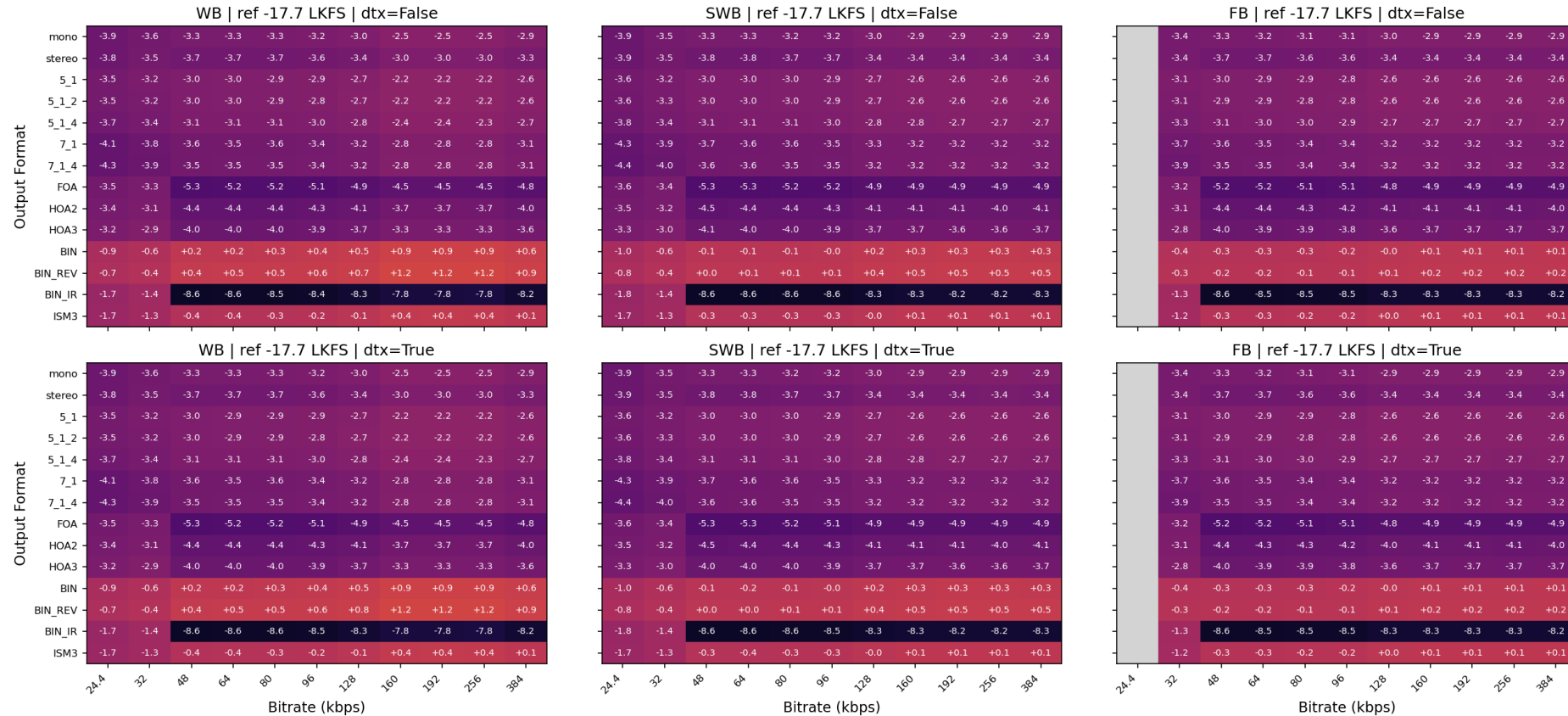
Output Loudness Heatmap across Bitrates: ISM2



IVAS Input-Output Loudness Harmonization

ISM3

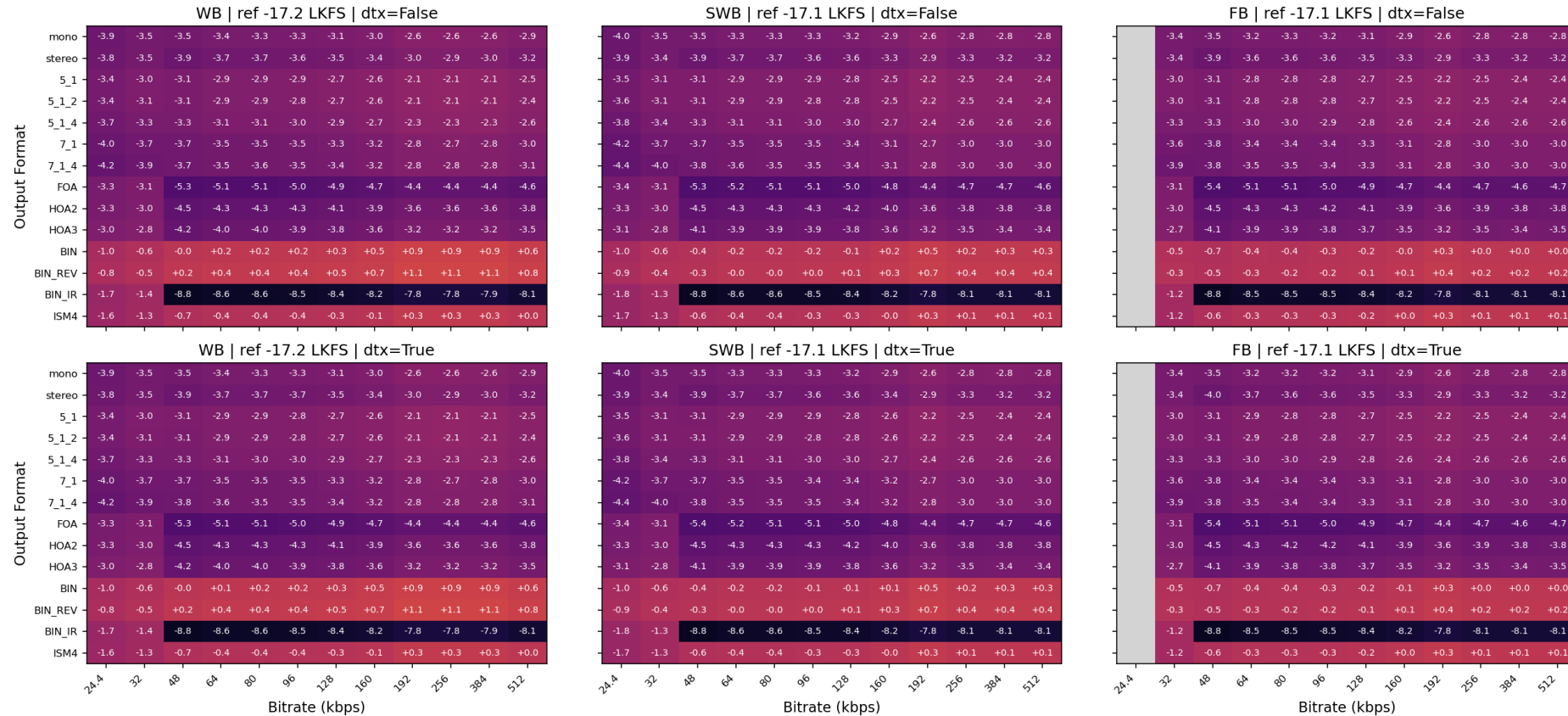
Output Loudness Heatmap across Bitrates: ISM3



IVAS Input-Output Loudness Harmonization

ISM4

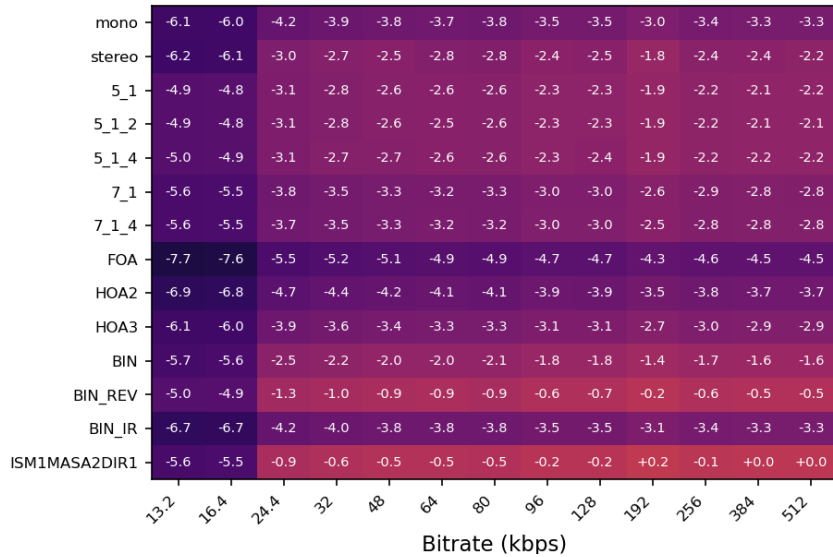
Output Loudness Heatmap across Bitrates: ISM4



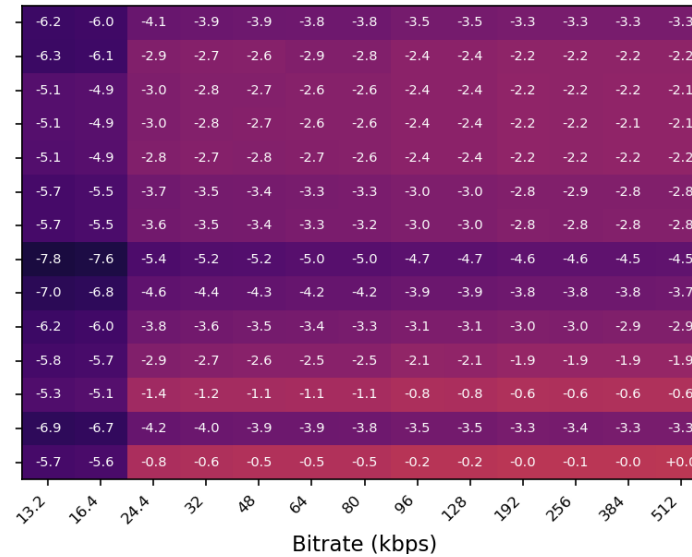
IVAS Input-Output Loudness Harmonization

ISM1MASA1DIR1

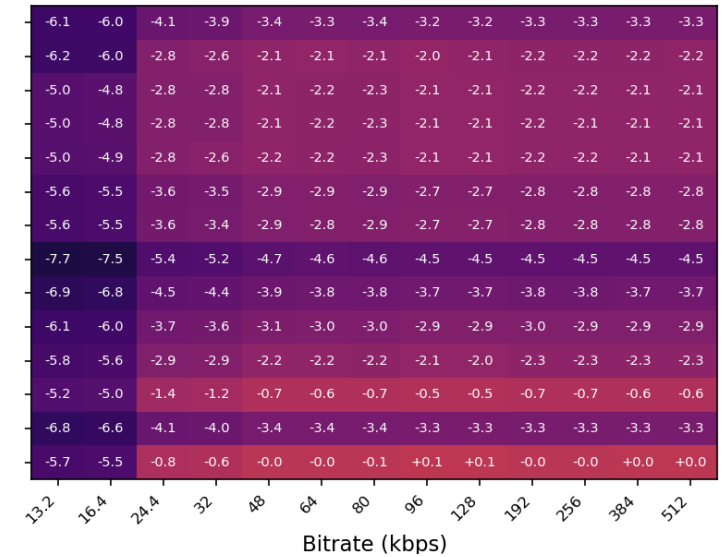
WB | ref -15.2 LKFS



Output Loudness Heatmap across Bitrates: ISM1MASA1DIR1
SWB | ref -15.2 LKFS



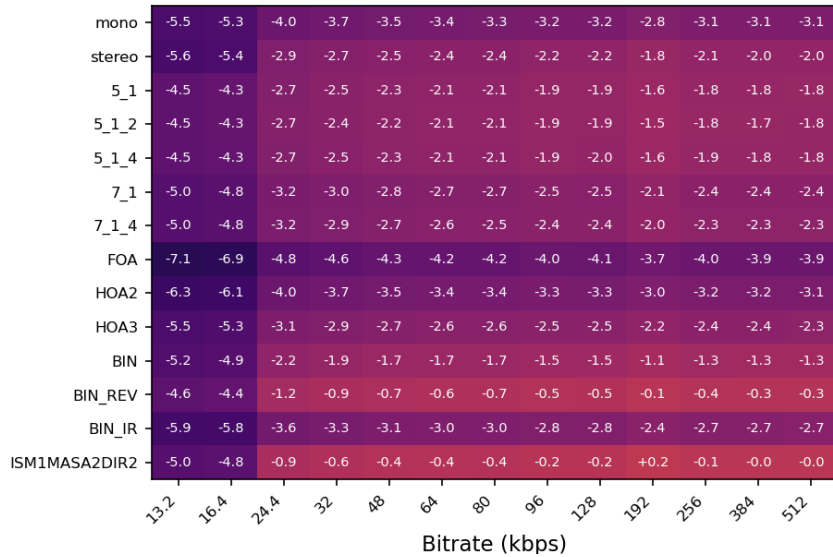
FB | ref -15.2 LKFS



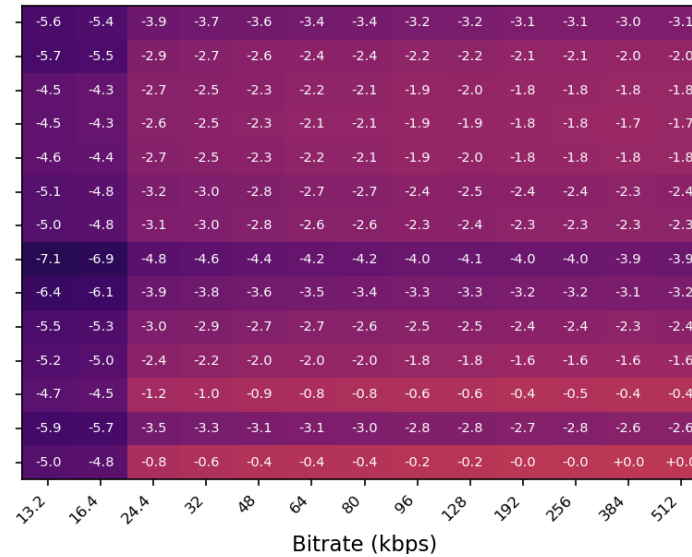
IVAS Input-Output Loudness Harmonization

ISM1MASA2DIR2

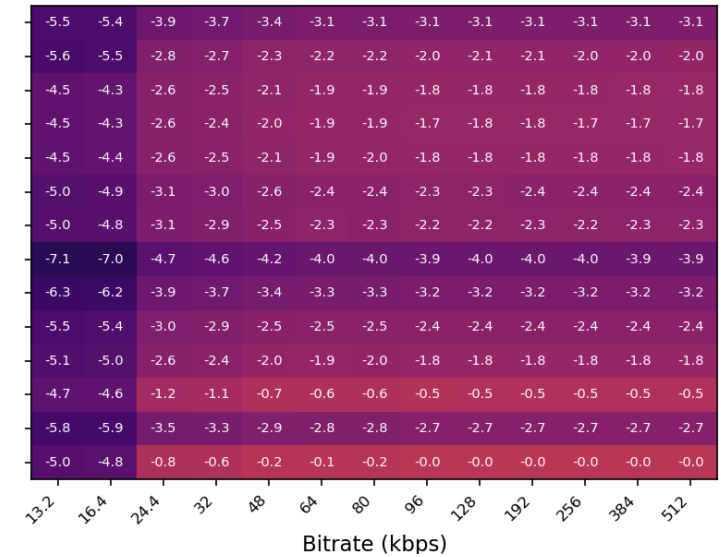
WB | ref -15.8 LKFS



Output Loudness Heatmap across Bitrates: ISM1MASA2DIR2
SWB | ref -15.8 LKFS



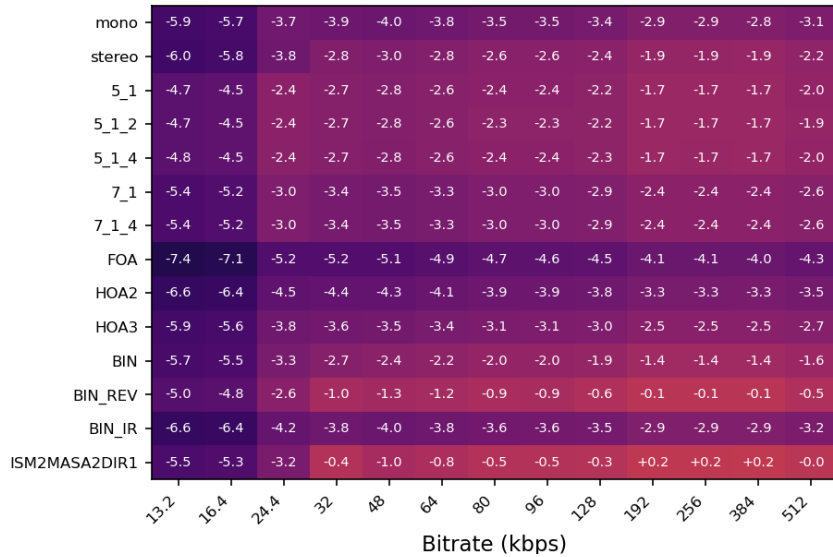
FB | ref -15.8 LKFS



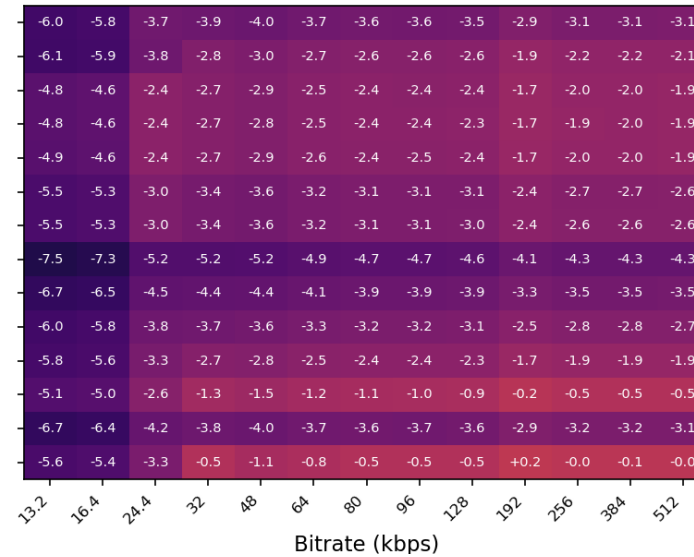
IVAS Input-Output Loudness Harmonization

ISM2MASA1DIR1

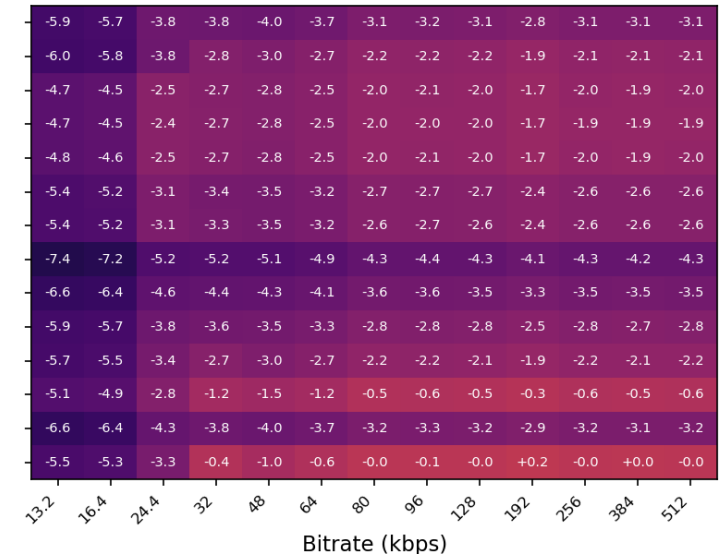
WB | ref -15.2 LKFS



Output Loudness Heatmap across Bitrates: ISM2MASA1DIR1
SWB | ref -15.2 LKFS



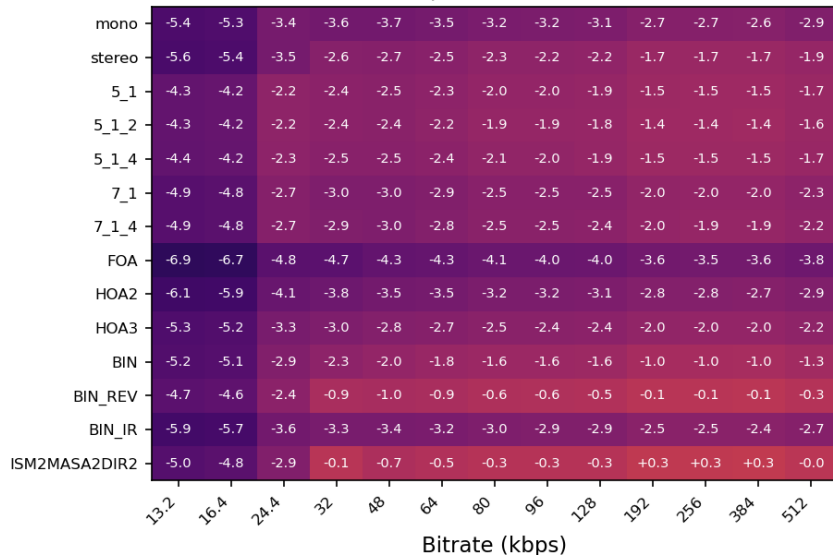
FB | ref -15.2 LKFS



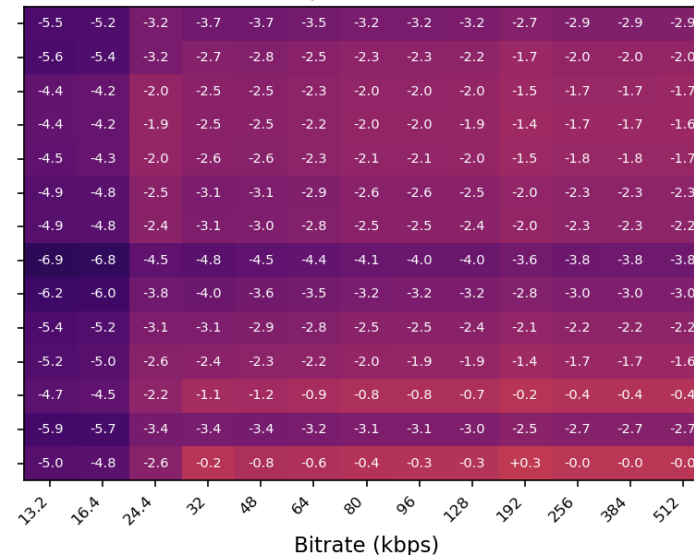
IVAS Input-Output Loudness Harmonization

ISM2MASA2DIR2

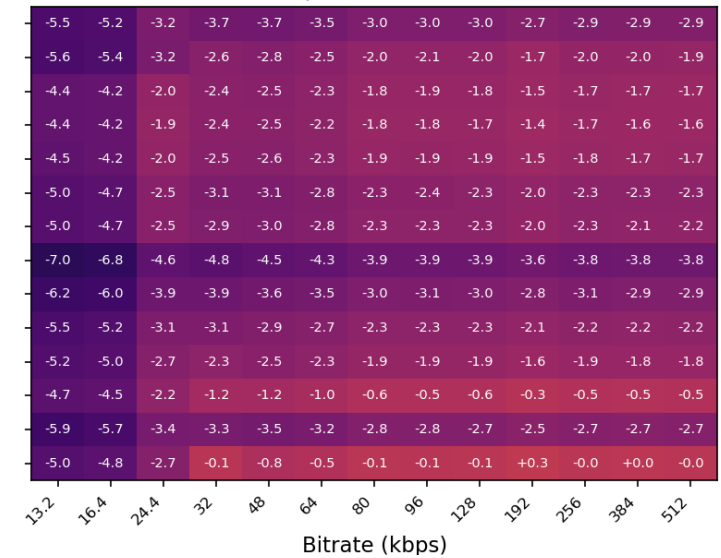
WB | ref -15.8 LKFS



Output Loudness Heatmap across Bitrates: ISM2MASA2DIR2
SWB | ref -15.8 LKFS



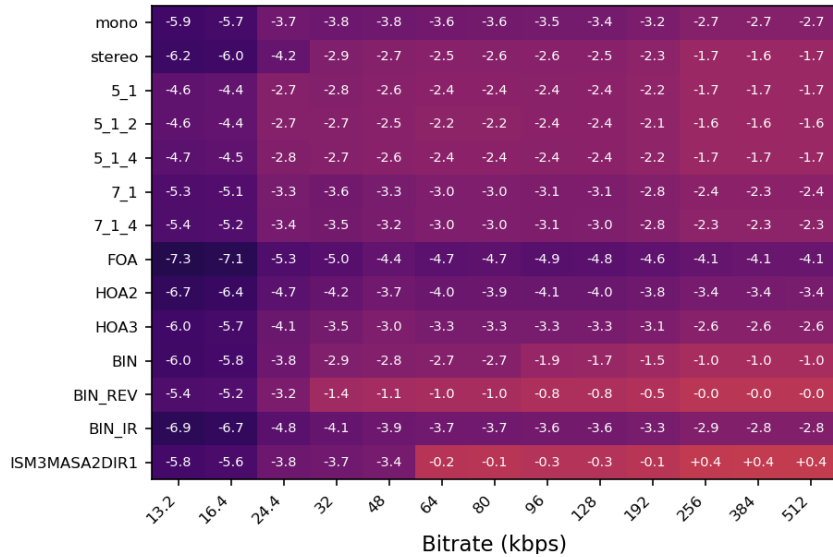
FB | ref -15.8 LKFS



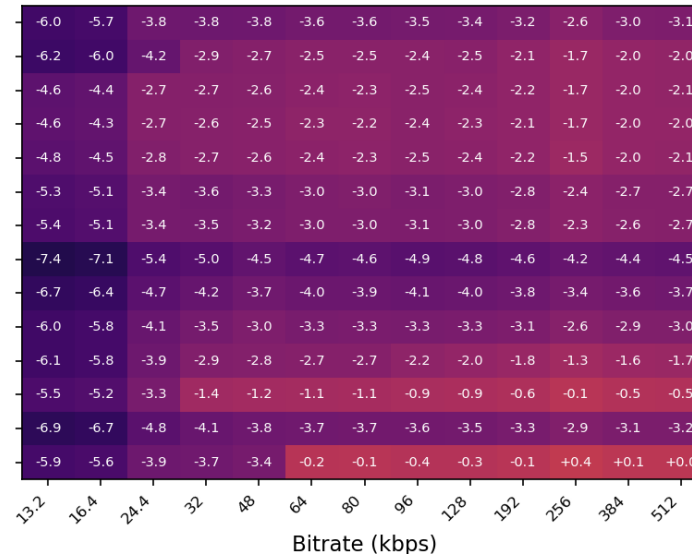
IVAS Input-Output Loudness Harmonization

ISM3MASA1DIR1

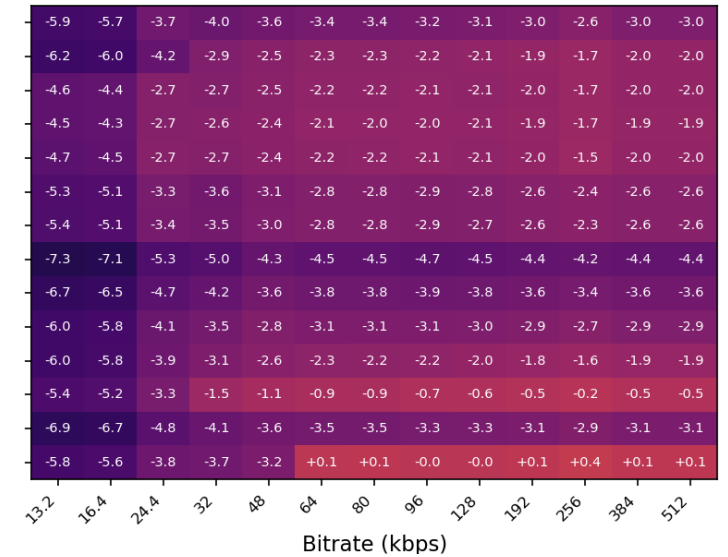
WB | ref -14.0 LKFS



Output Loudness Heatmap across Bitrates: ISM3MASA1DIR1
SWB | ref -14.0 LKFS



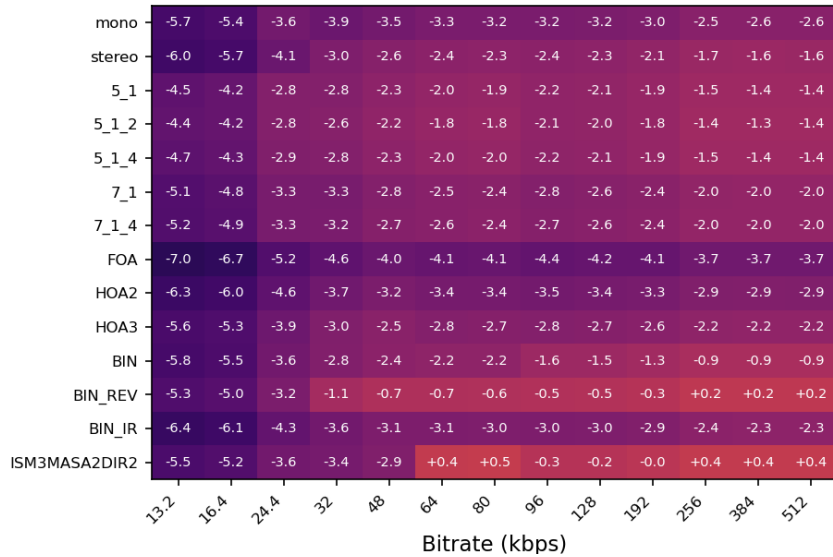
FB | ref -14.0 LKFS



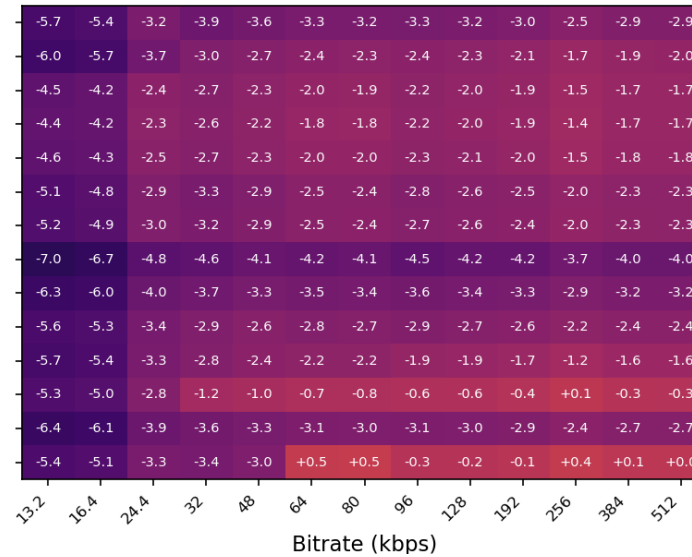
IVAS Input-Output Loudness Harmonization

ISM3MASA2DIR2

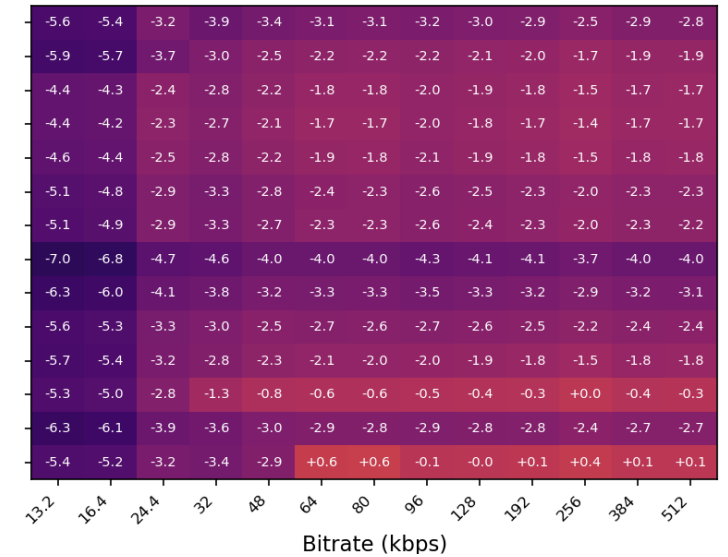
WB | ref -14.7 LKFS



Output Loudness Heatmap across Bitrates: ISM3MASA2DIR2
SWB | ref -14.7 LKFS



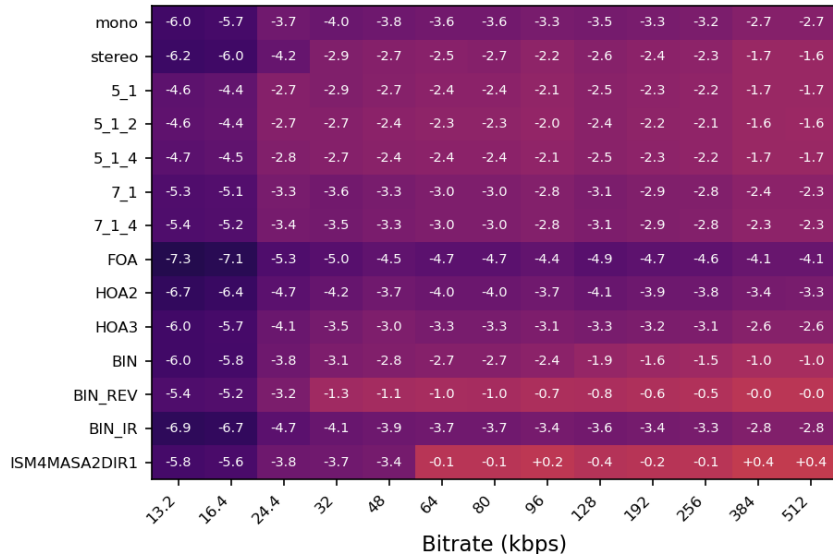
FB | ref -14.7 LKFS



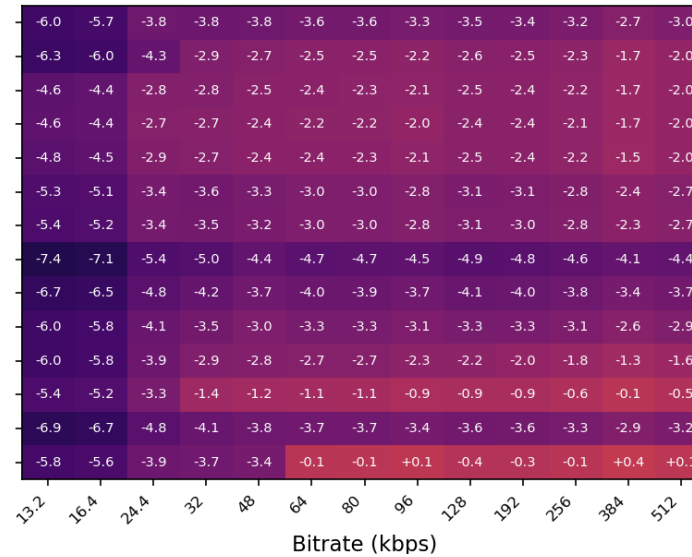
IVAS Input-Output Loudness Harmonization

ISM4MASA1DIR1

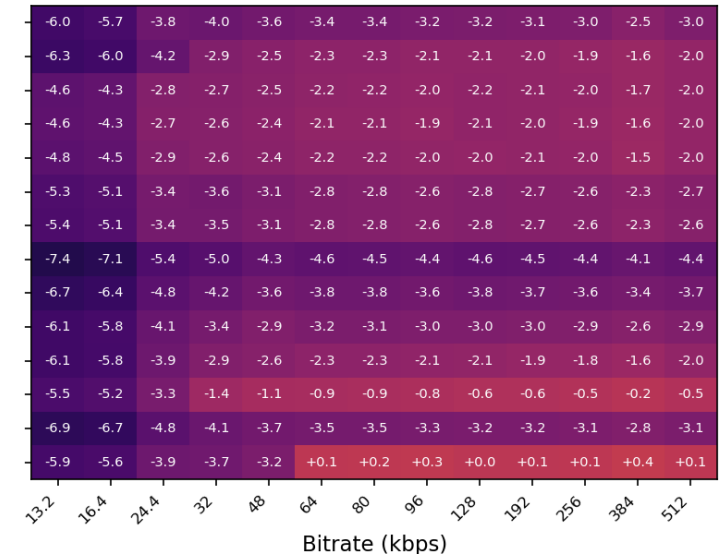
WB | ref -14.0 LKFS



Output Loudness Heatmap across Bitrates: ISM4MASA1DIR1
SWB | ref -14.0 LKFS



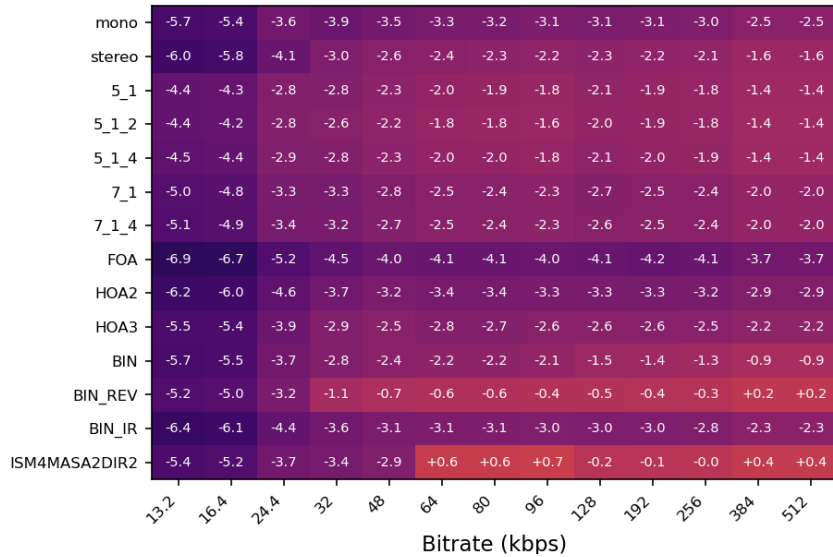
FB | ref -14.0 LKFS



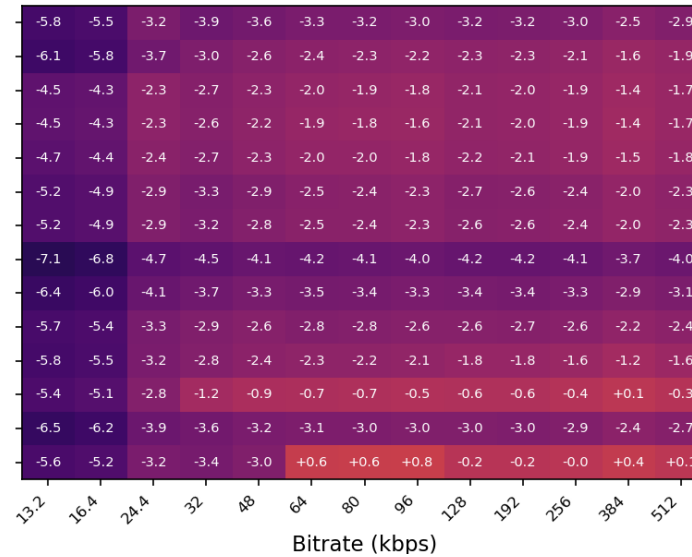
IVAS Input-Output Loudness Harmonization

ISM4MASA2DIR2

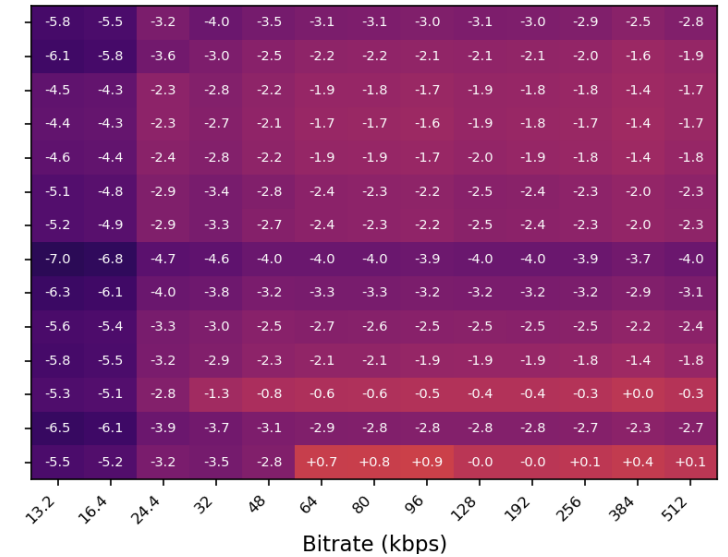
WB | ref -14.7 LKFS



Output Loudness Heatmap across Bitrates: ISM4MASA2DIR2
SWB | ref -14.6 LKFS

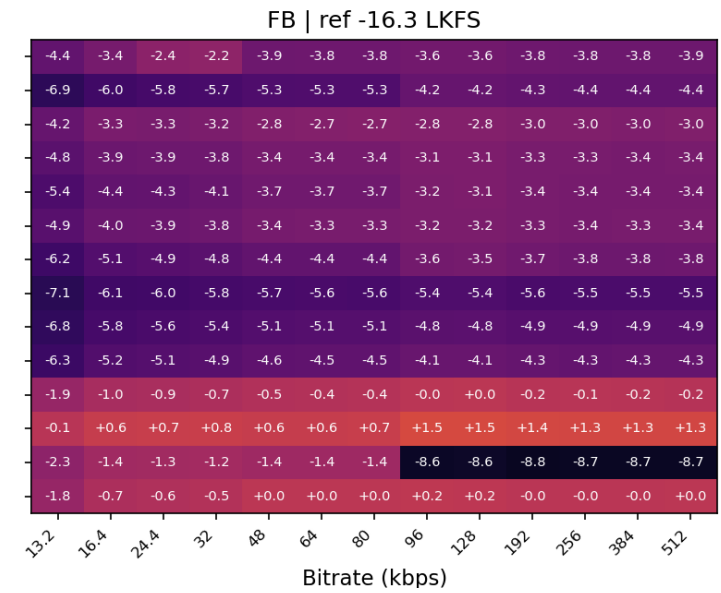
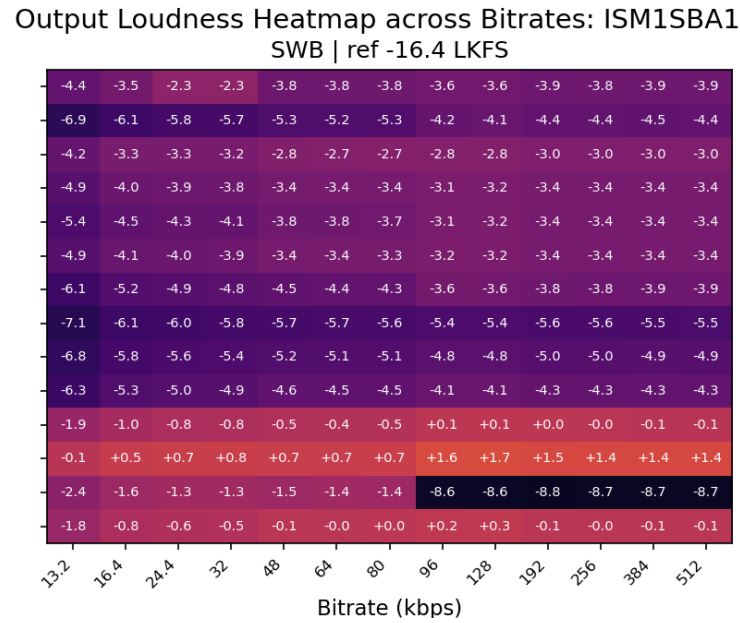
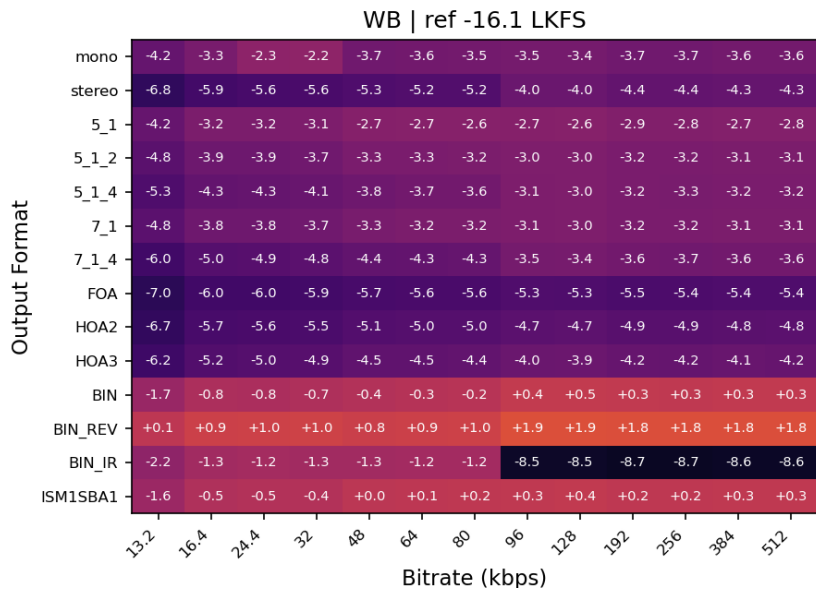


FB | ref -14.6 LKFS



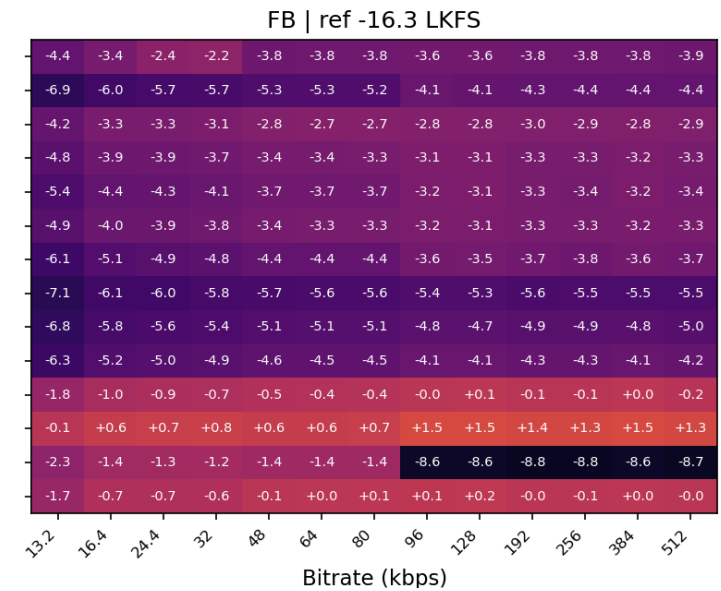
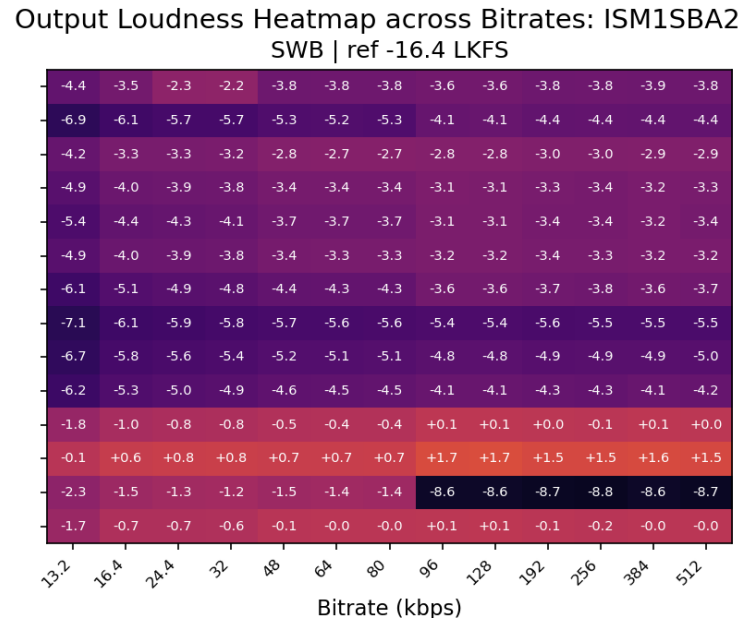
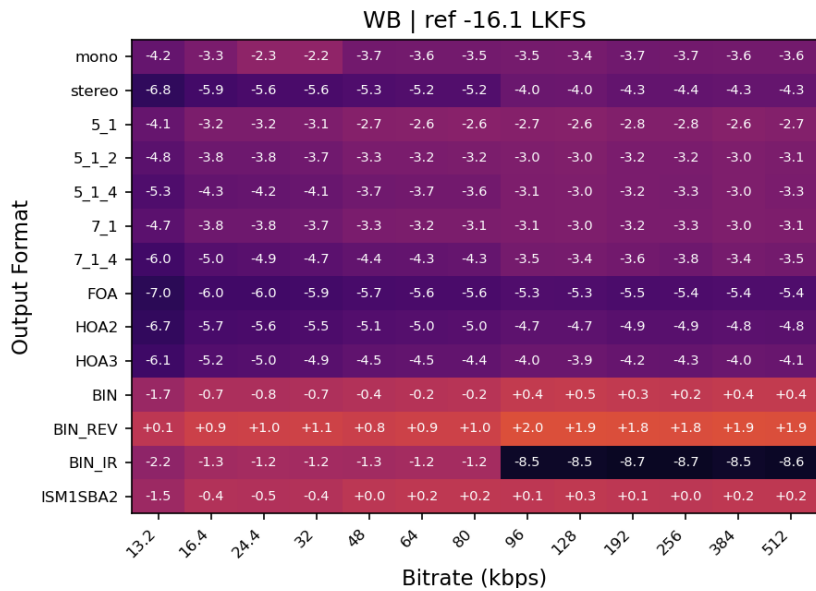
IVAS Input-Output Loudness Harmonization

ISM1SBA1



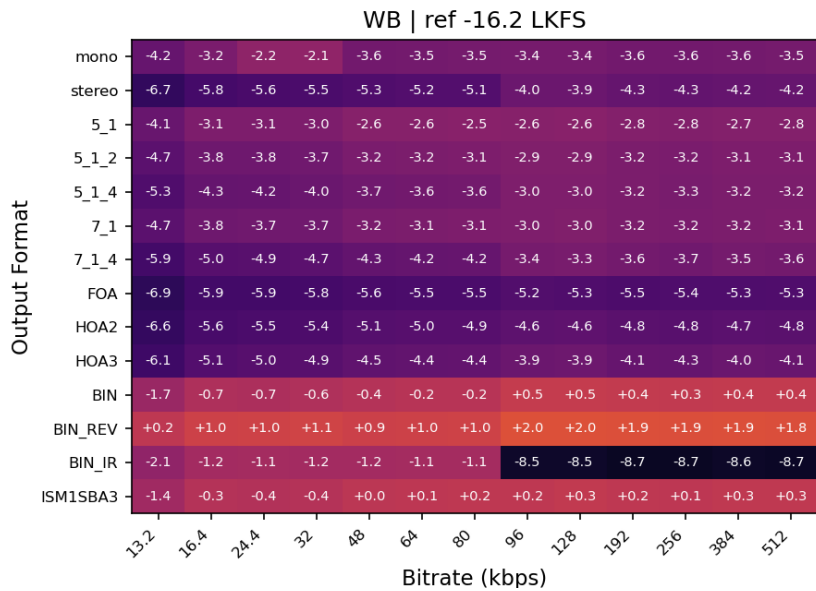
IVAS Input-Output Loudness Harmonization

ISM1SBA2

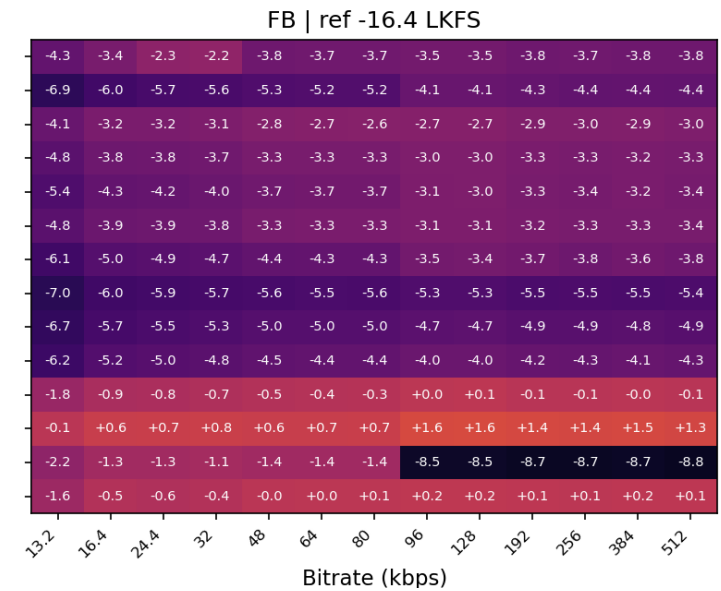
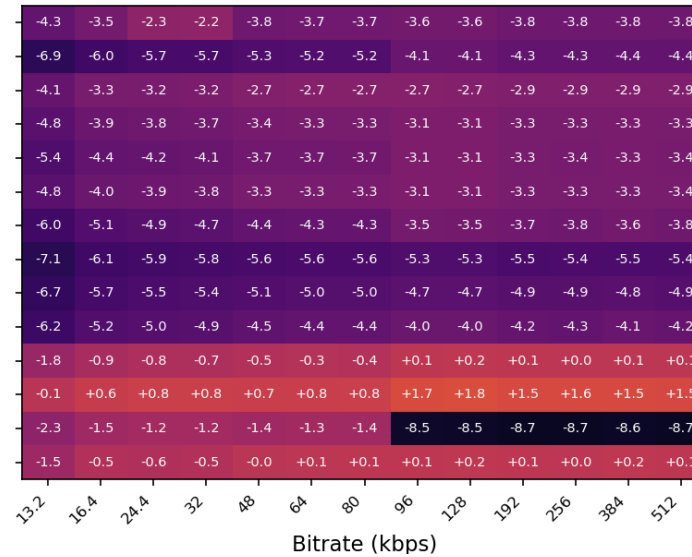


IVAS Input-Output Loudness Harmonization

ISM1SBA3

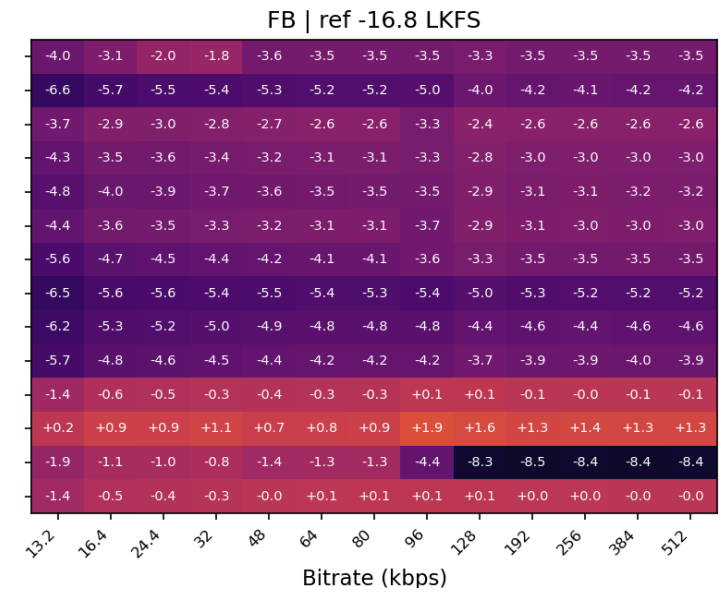
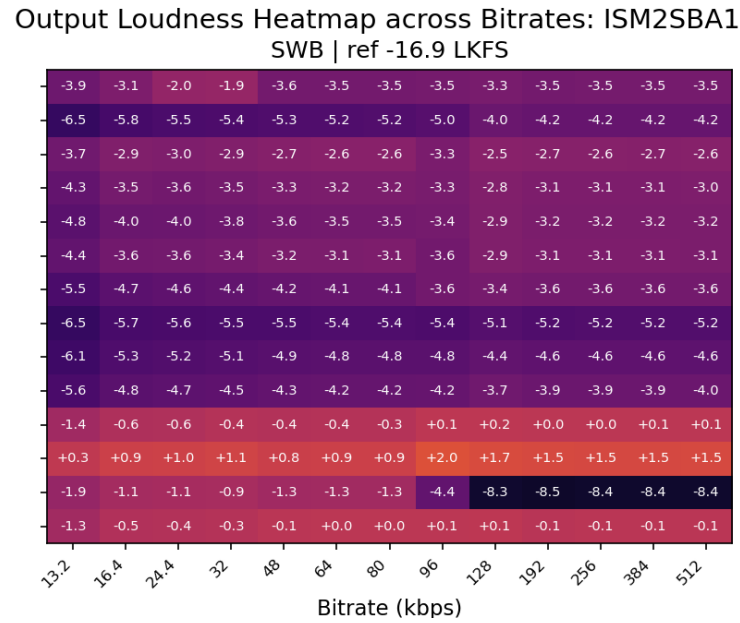
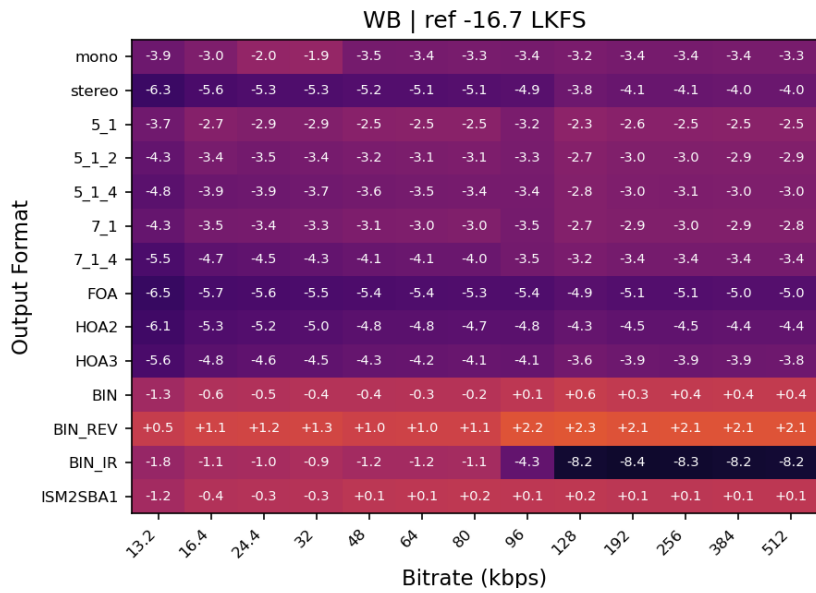


Output Loudness Heatmap across Bitrates: ISM1SBA3
SWB | ref -16.4 LKFS



IVAS Input-Output Loudness Harmonization

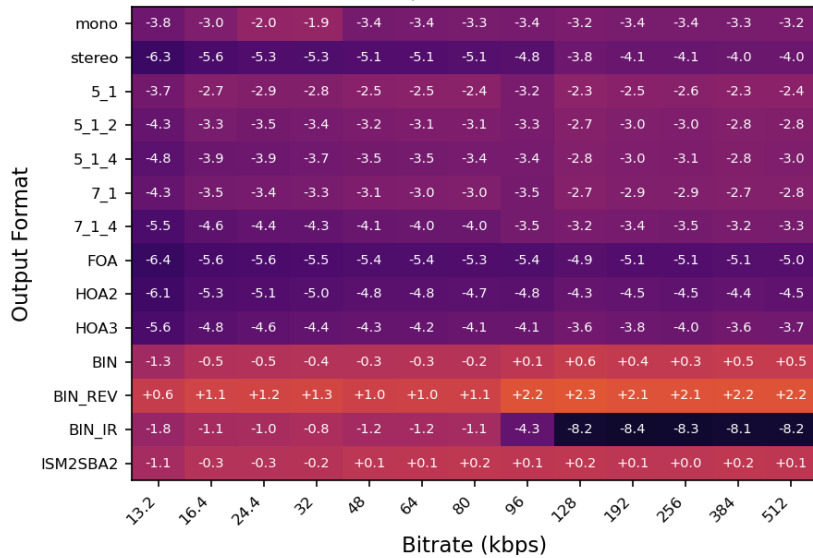
ISM2SBA1



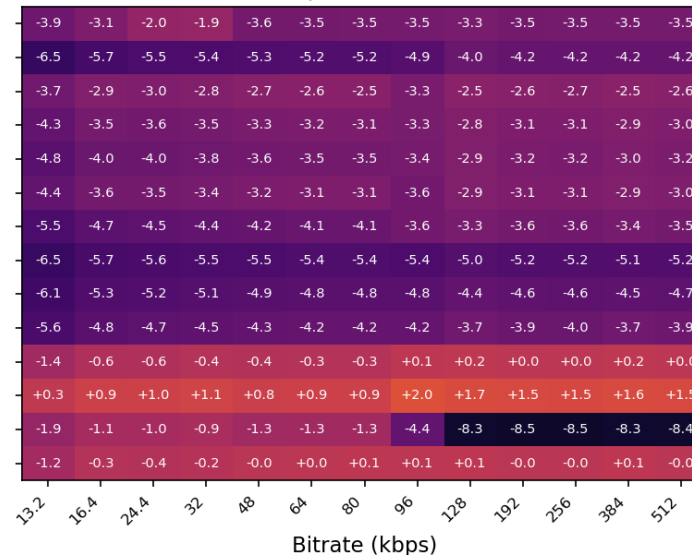
IVAS Input-Output Loudness Harmonization

ISM2SBA2

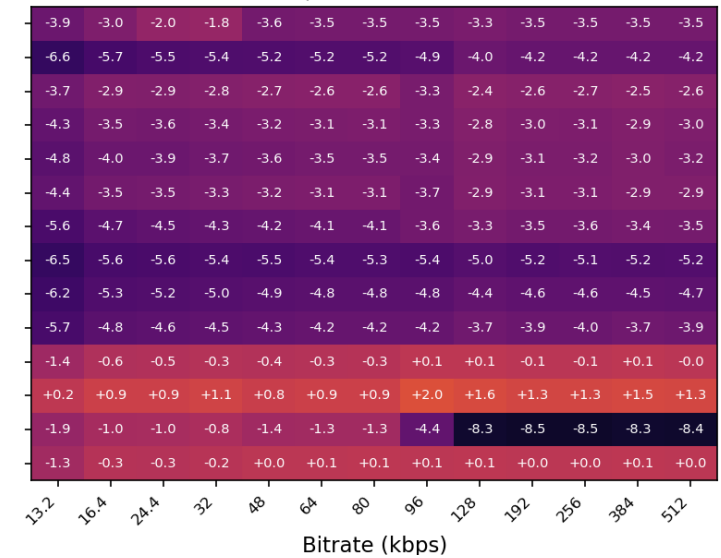
WB | ref -16.8 LKFS



Output Loudness Heatmap across Bitrates: ISM2SBA2
SWB | ref -16.9 LKFS



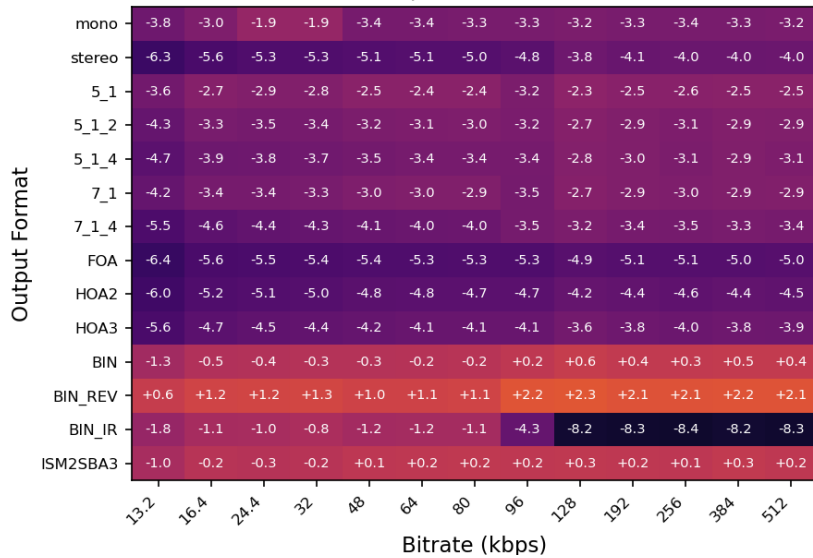
FB | ref -16.8 LKFS



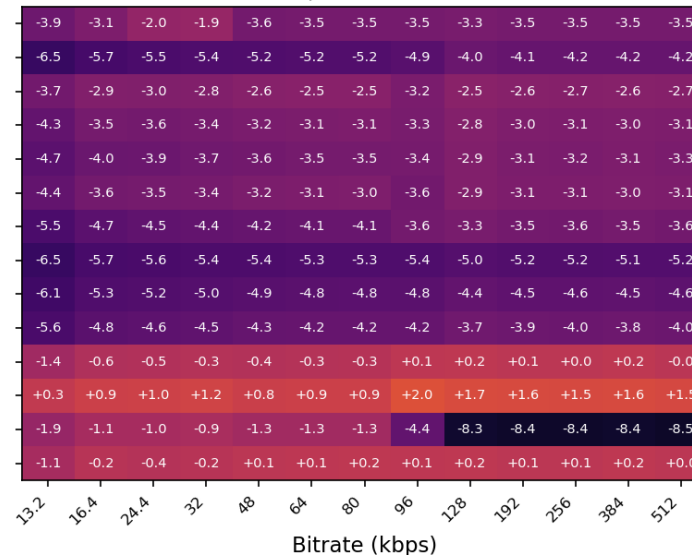
IVAS Input-Output Loudness Harmonization

ISM2SBA3

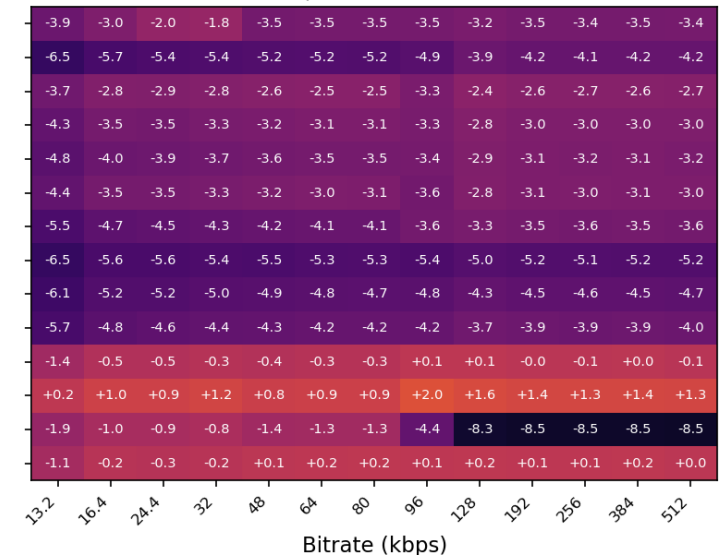
WB | ref -16.8 LKFS



Output Loudness Heatmap across Bitrates: ISM2SBA3
SWB | ref -16.9 LKFS

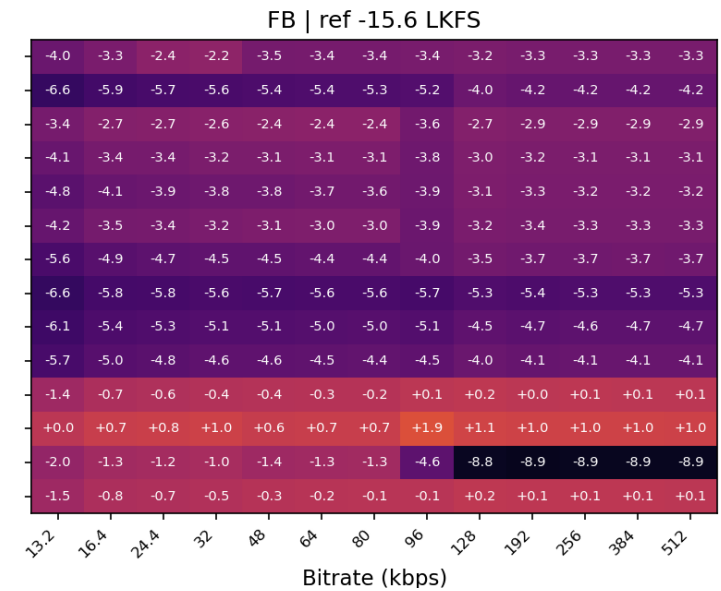
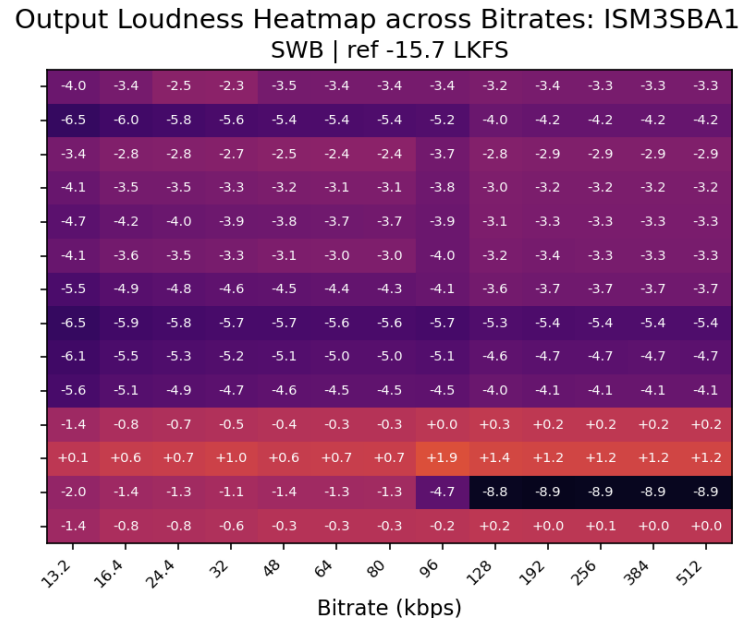
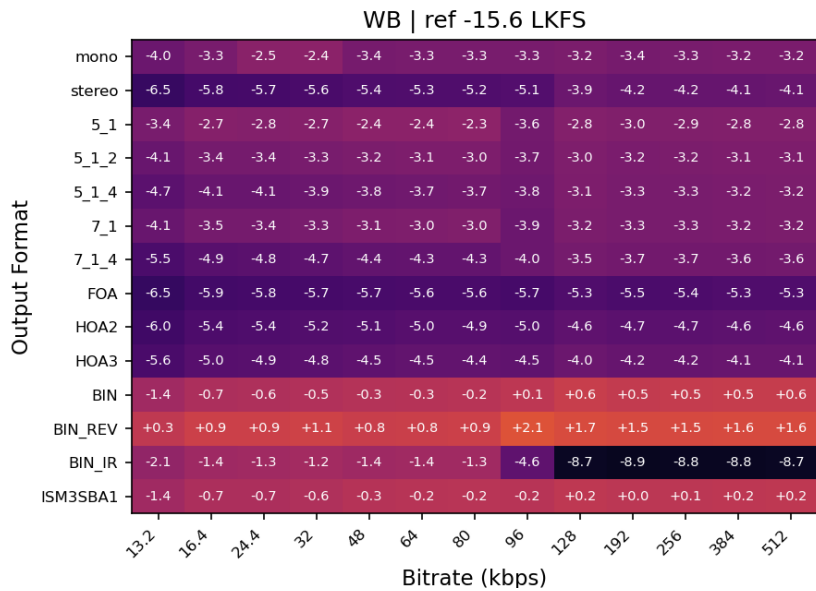


FB | ref -16.8 LKFS



IVAS Input-Output Loudness Harmonization

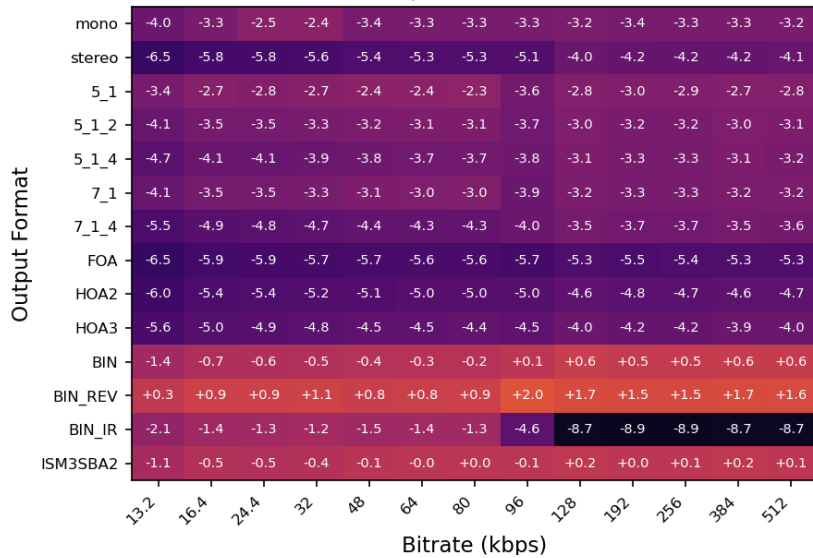
ISM3SBA1



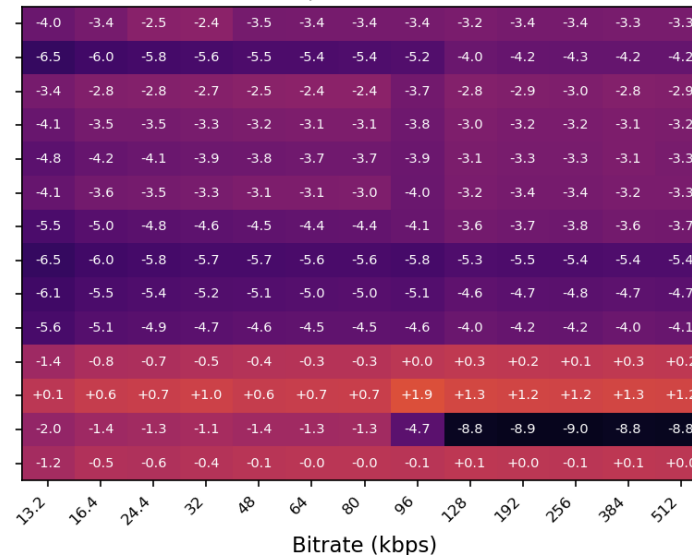
IVAS Input-Output Loudness Harmonization

ISM3SBA2

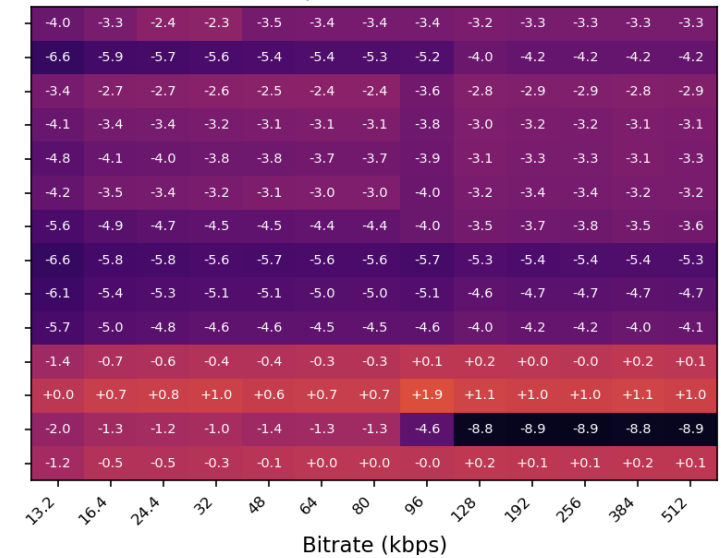
WB | ref -15.6 LKFS



Output Loudness Heatmap across Bitrates: ISM3SBA2
SWB | ref -15.7 LKFS



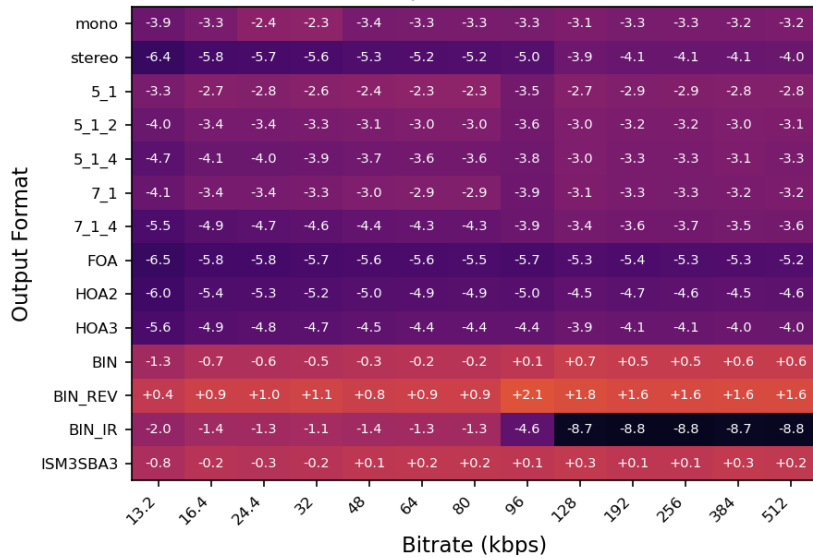
FB | ref -15.6 LKFS



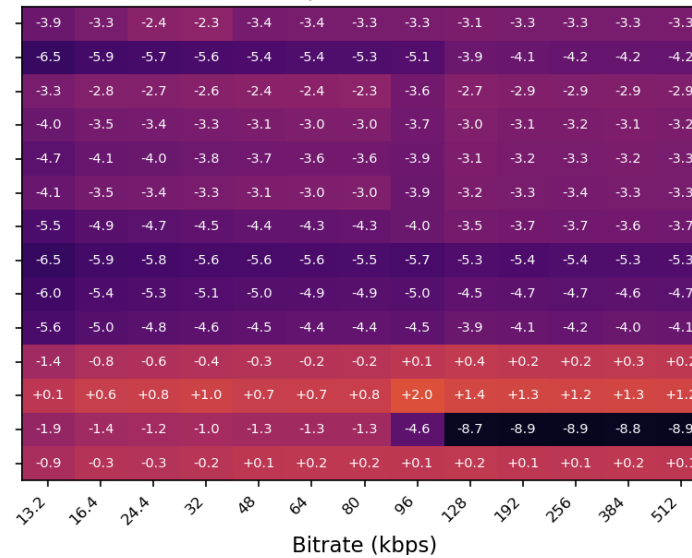
IVAS Input-Output Loudness Harmonization

ISM3SBA3

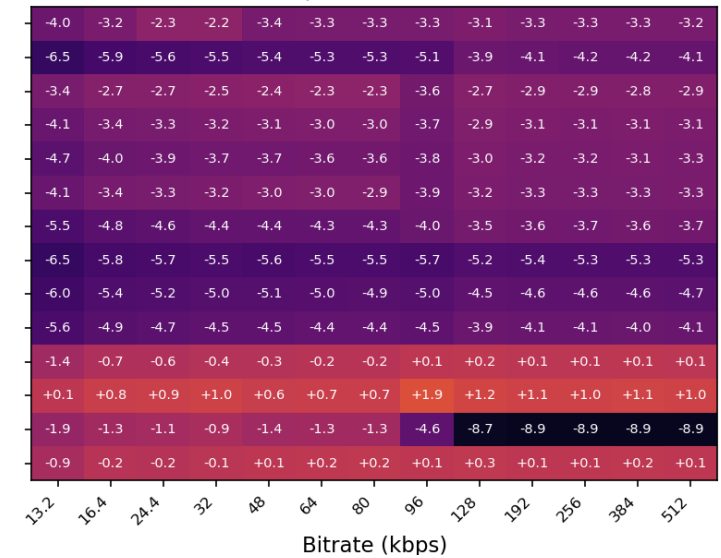
WB | ref -15.7 LKFS



Output Loudness Heatmap across Bitrates: ISM3SBA3
SWB | ref -15.7 LKFS

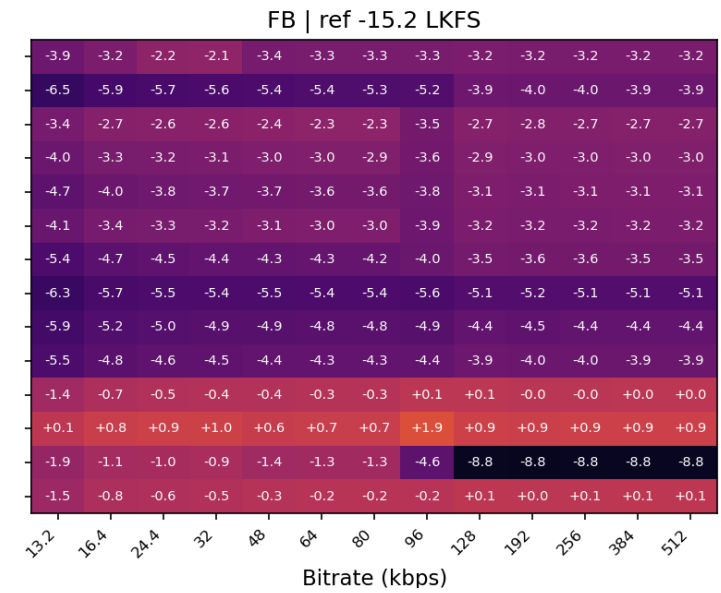
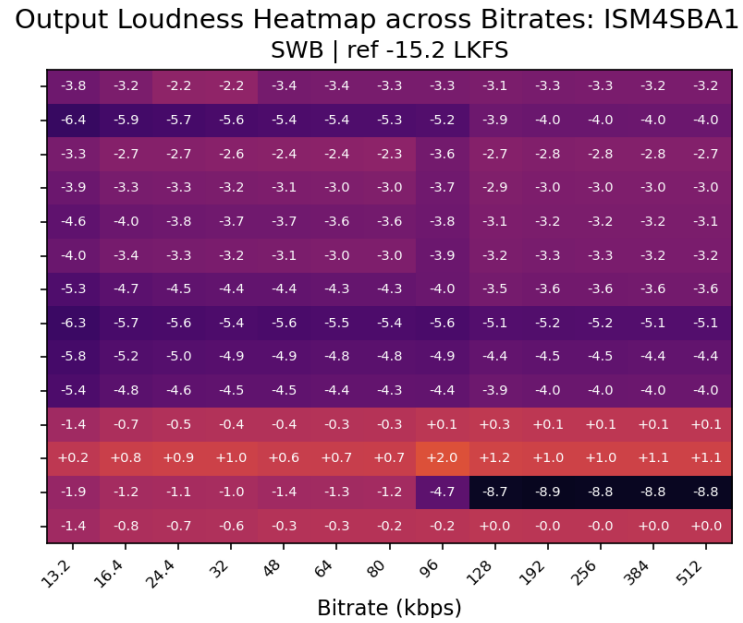
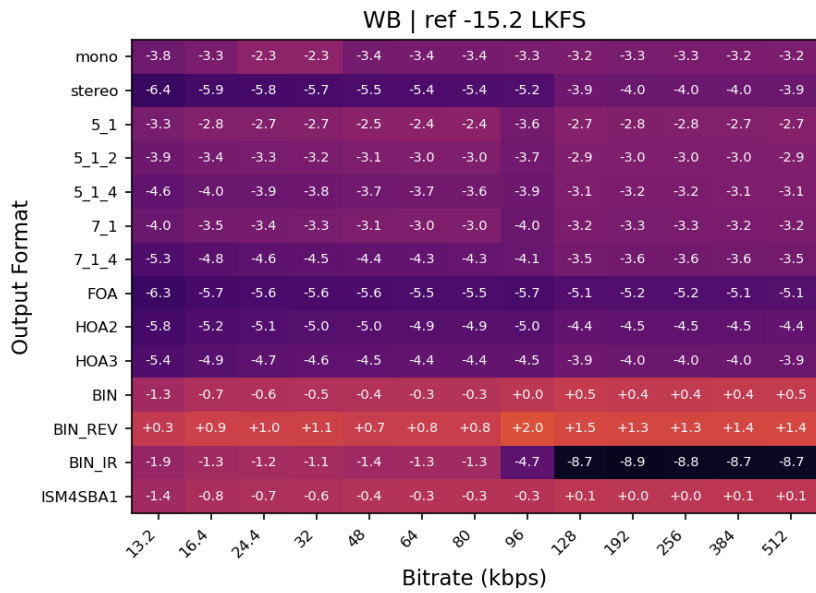


FB | ref -15.7 LKFS



IVAS Input-Output Loudness Harmonization

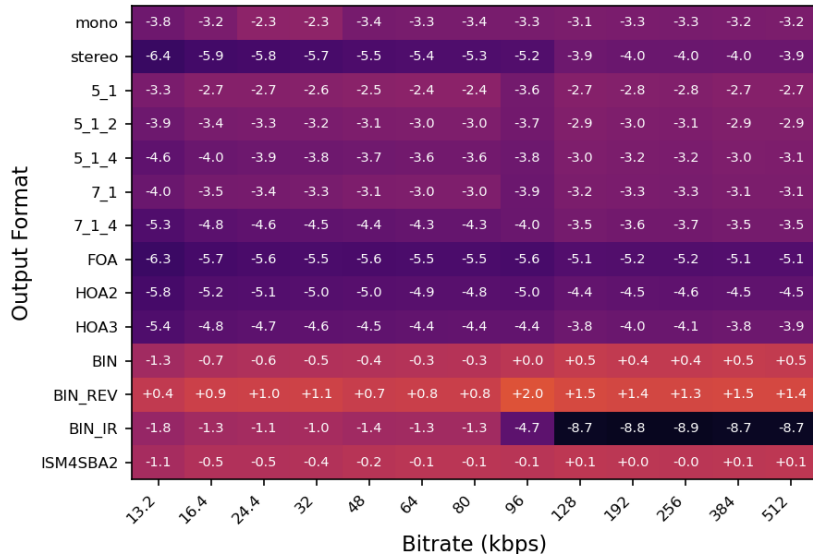
ISM4SBA1



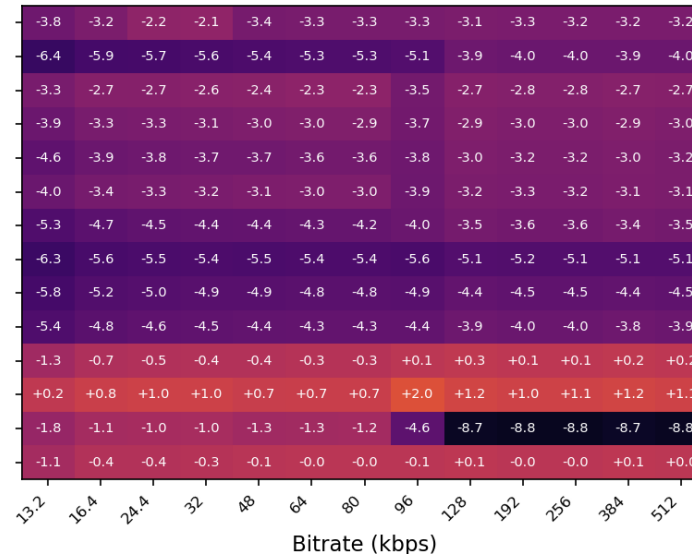
IVAS Input-Output Loudness Harmonization

ISM4SBA2

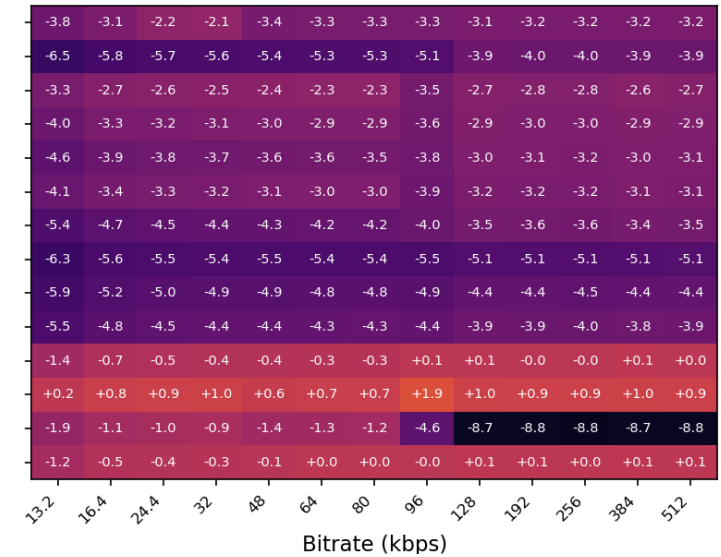
WB | ref -15.2 LKFS



Output Loudness Heatmap across Bitrates: ISM4SBA2
SWB | ref -15.2 LKFS



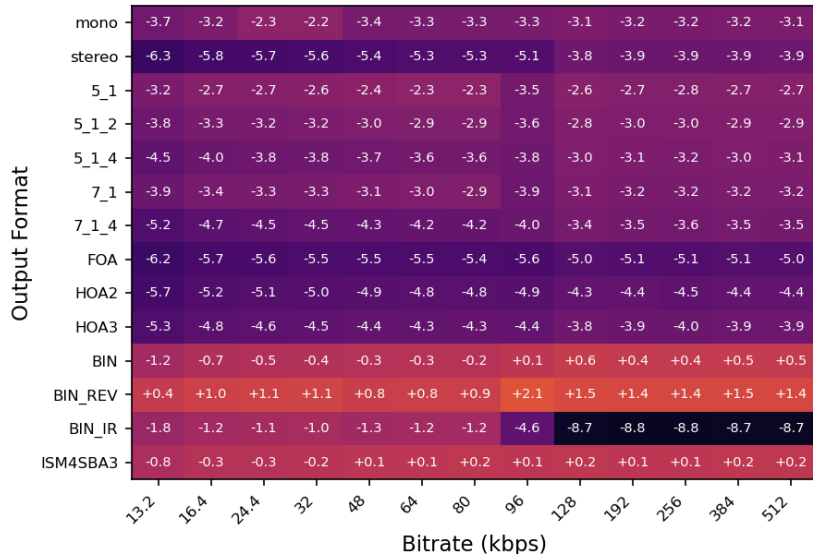
FB | ref -15.2 LKFS



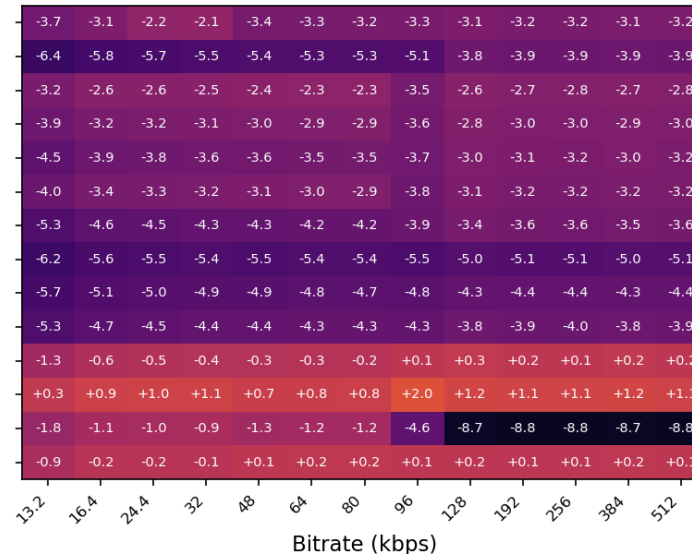
IVAS Input-Output Loudness Harmonization

ISM4SBA3

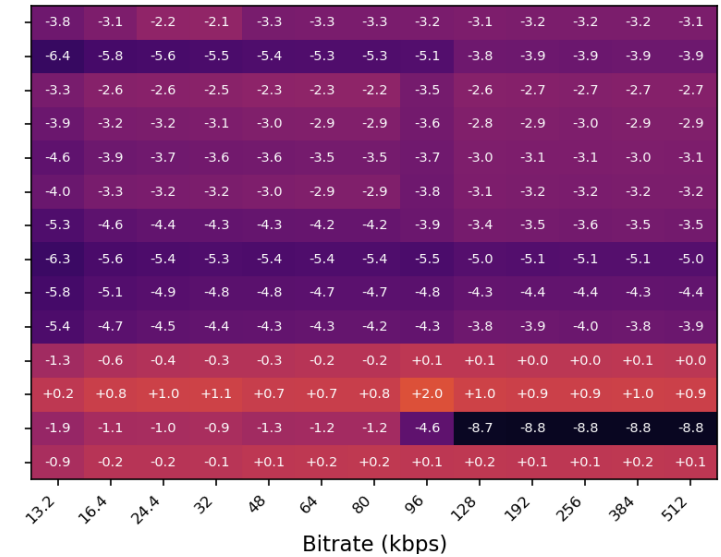
WB | ref -15.3 LKFS



Output Loudness Heatmap across Bitrates: ISM4SBA3
SWB | ref -15.3 LKFS



FB | ref -15.2 LKFS



Thank you
for your time
