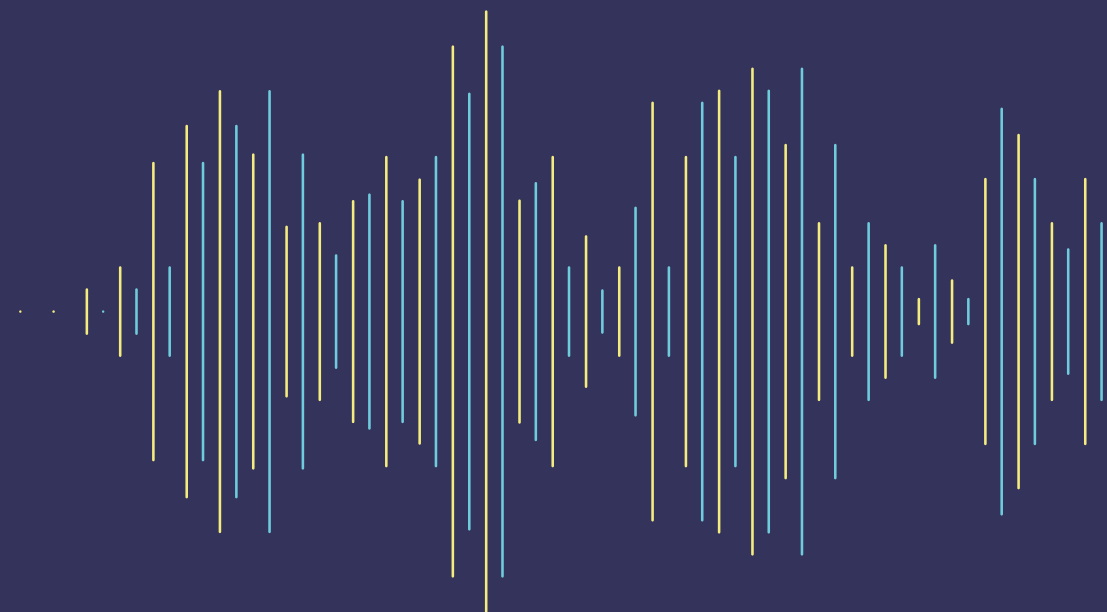


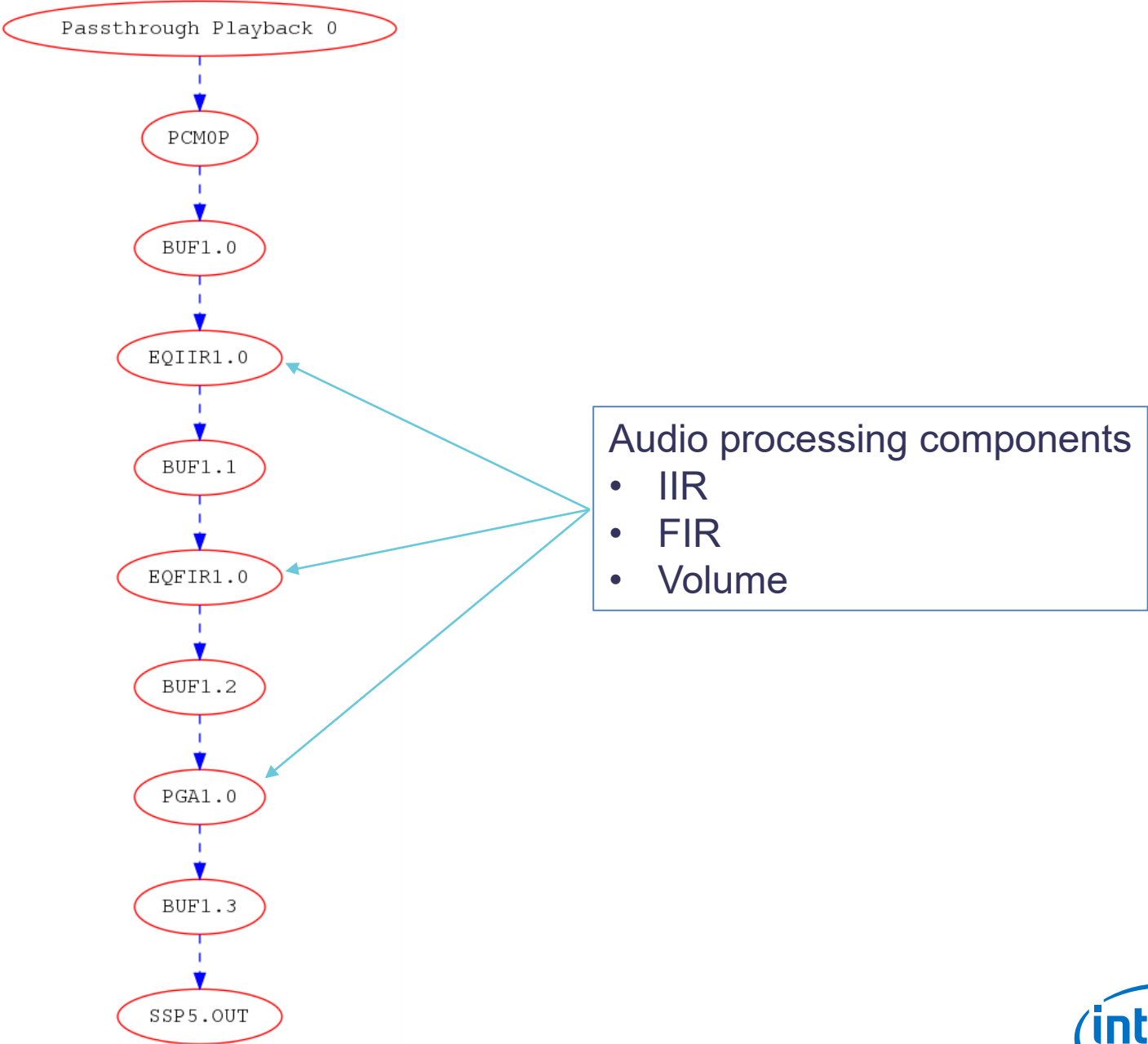
Audio Demo

**Seppo Ingalsuo and
Ranjani Sridharan**

Open Source Summit + Embedded Linux Conference Europe 2018

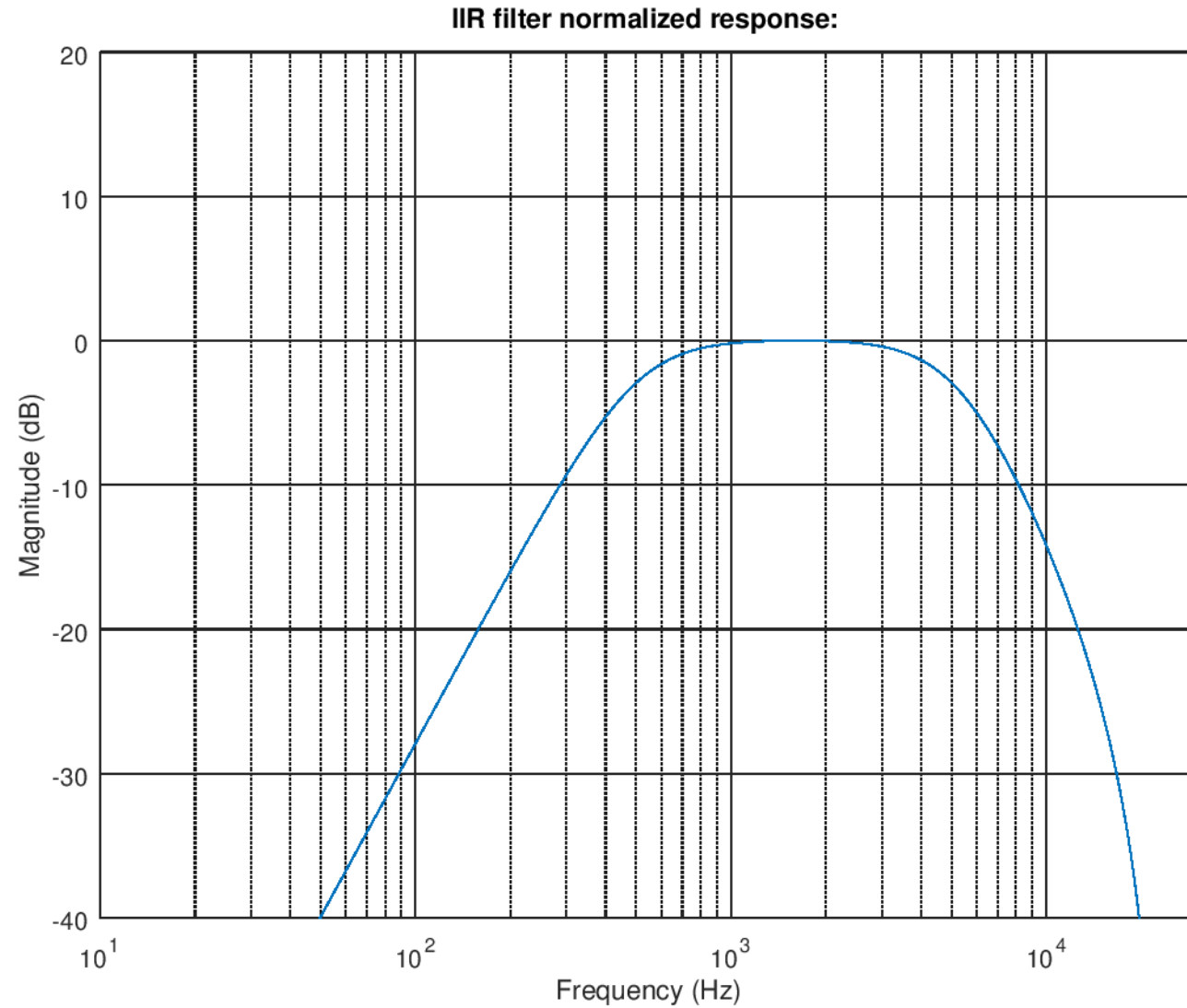


The Firmware Topology



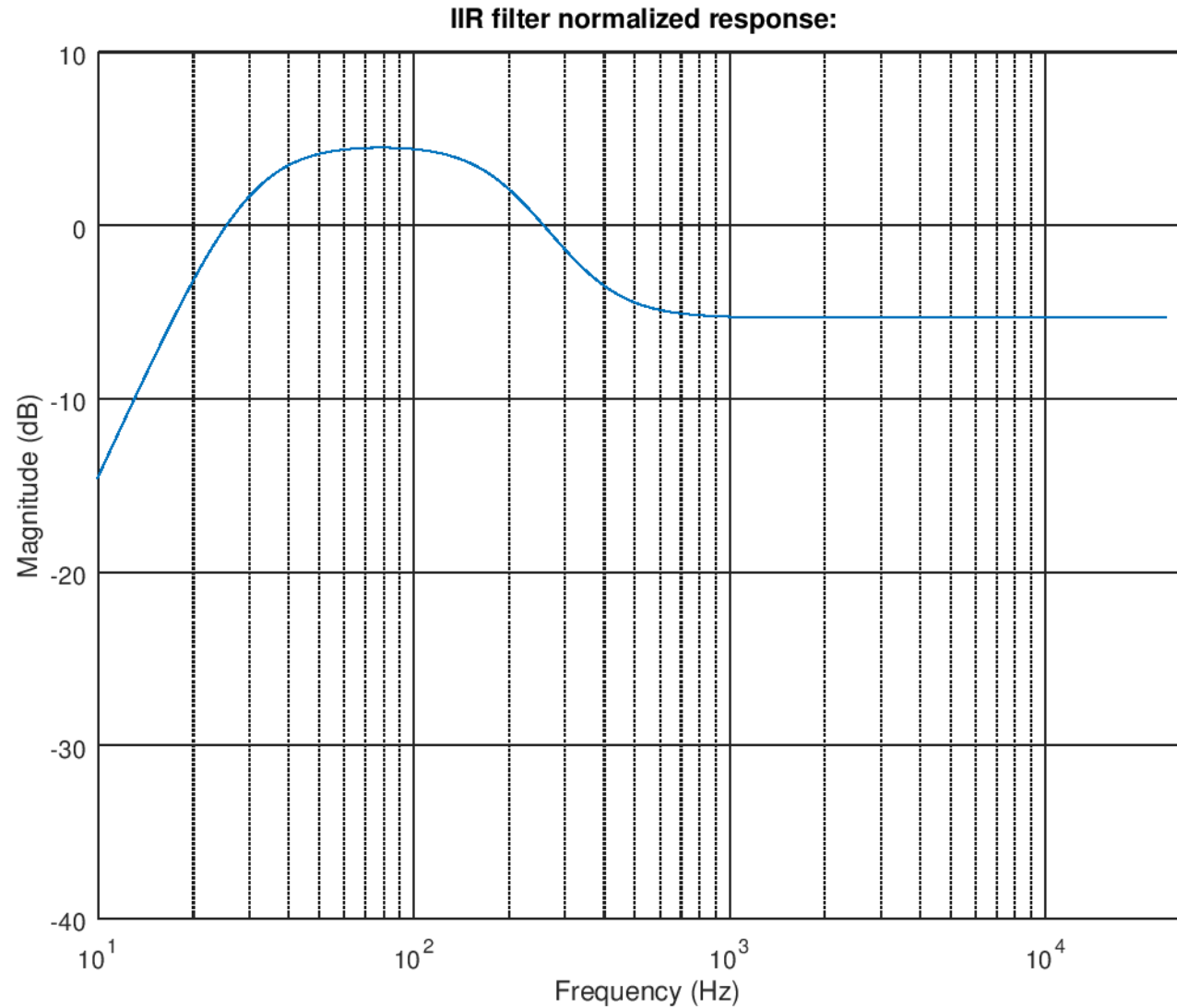
EQ Demo: Band-Pass with IIR

- 2nd order Butterworth high-pass at 500 Hz
- 2nd order Butterworth low-pass at 5000 Hz



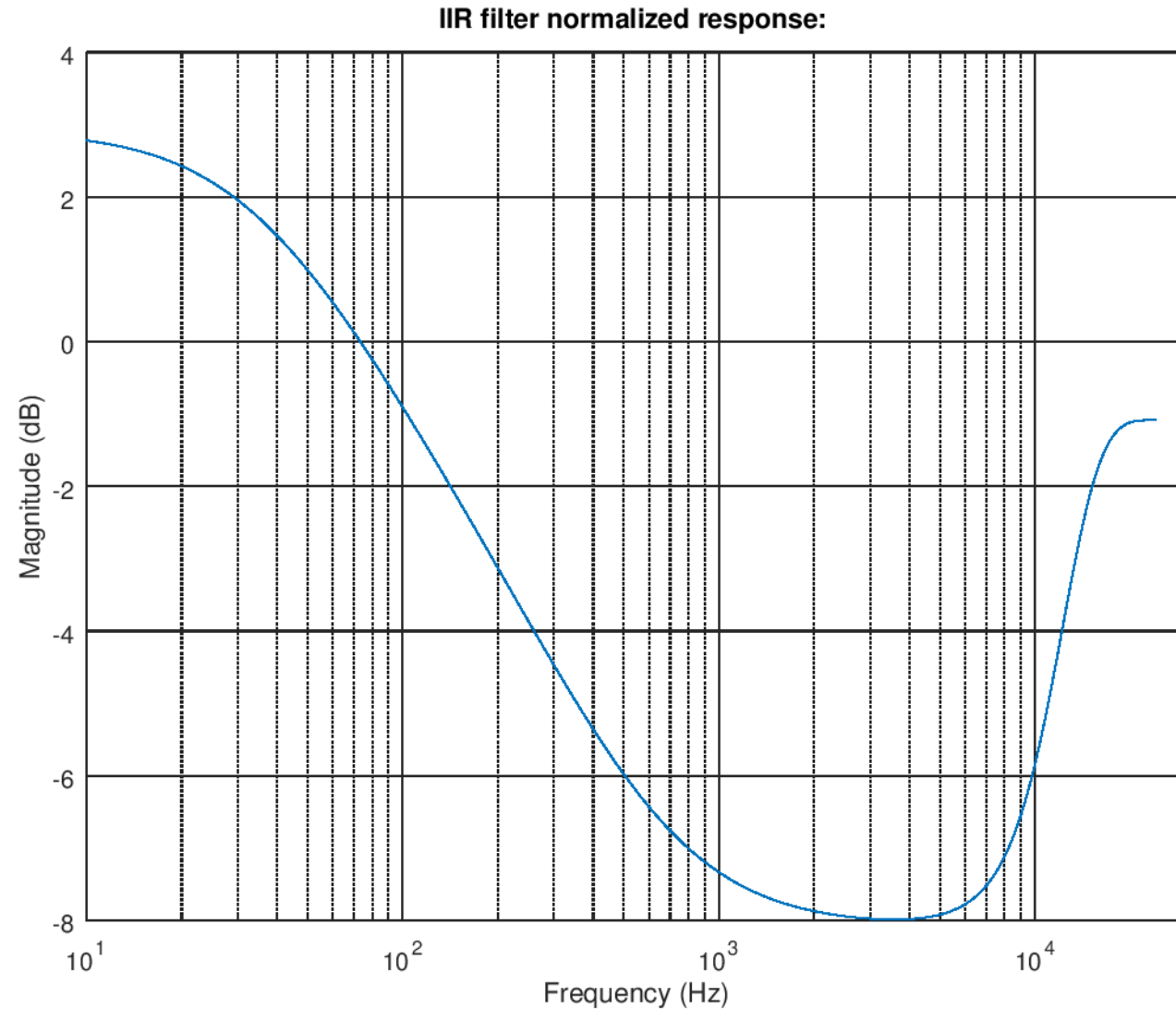
EQ Demo: Bass Boost with IIR

- 2nd order high-pass at 30 Hz
- 2nd order low-shelf at 200 Hz with 10 dB gain



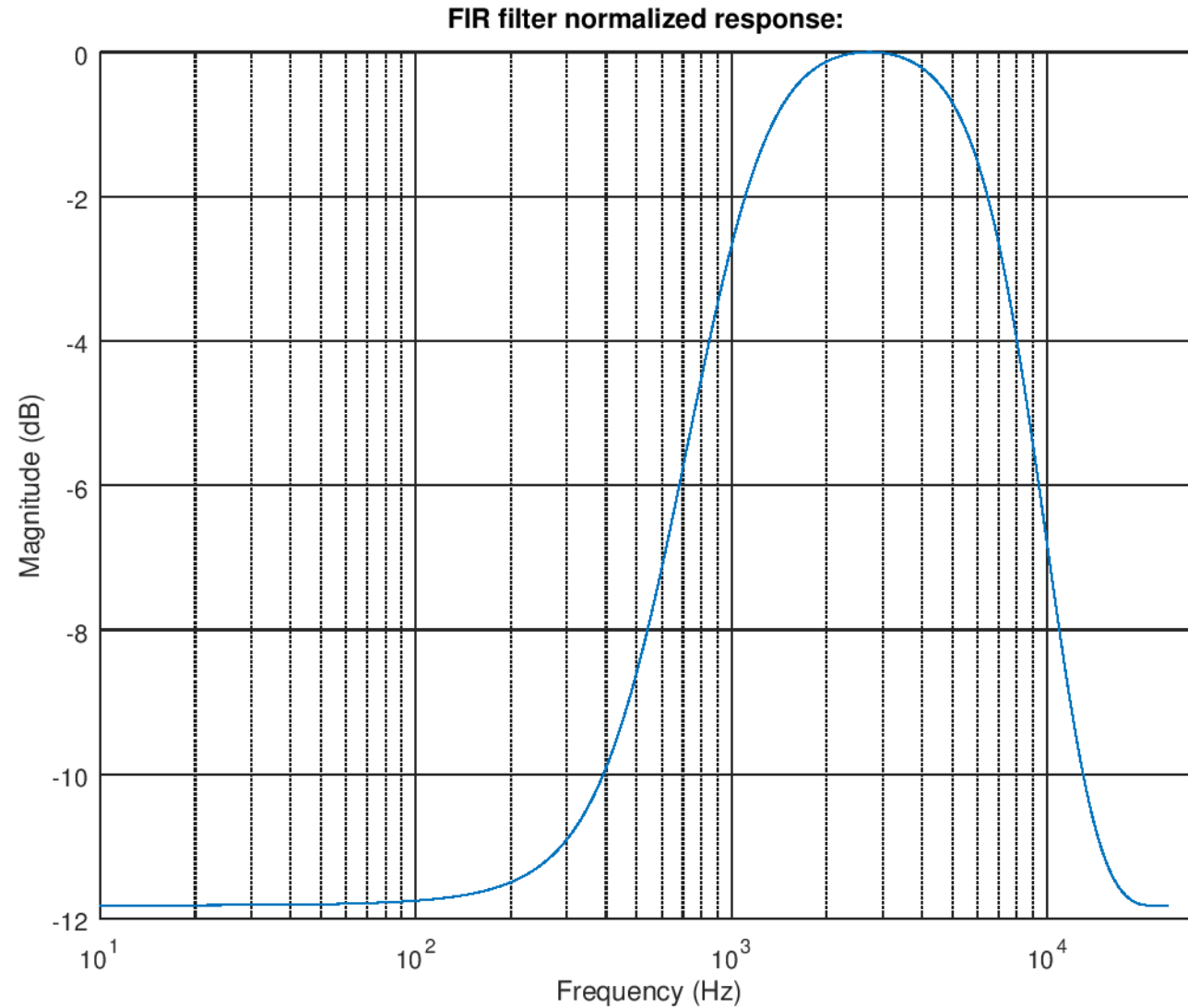
EQ Demo: Loudness Effect with IIR – Target Delta of Two Subjective Equal Loudness Contours

- Four low-shelf 1st order blocks at 40, 80, 200, 400 Hz with 3 dB gain
- One high-shelf 2nd order block at 13 kHz with 7 dB gain
- Manual design



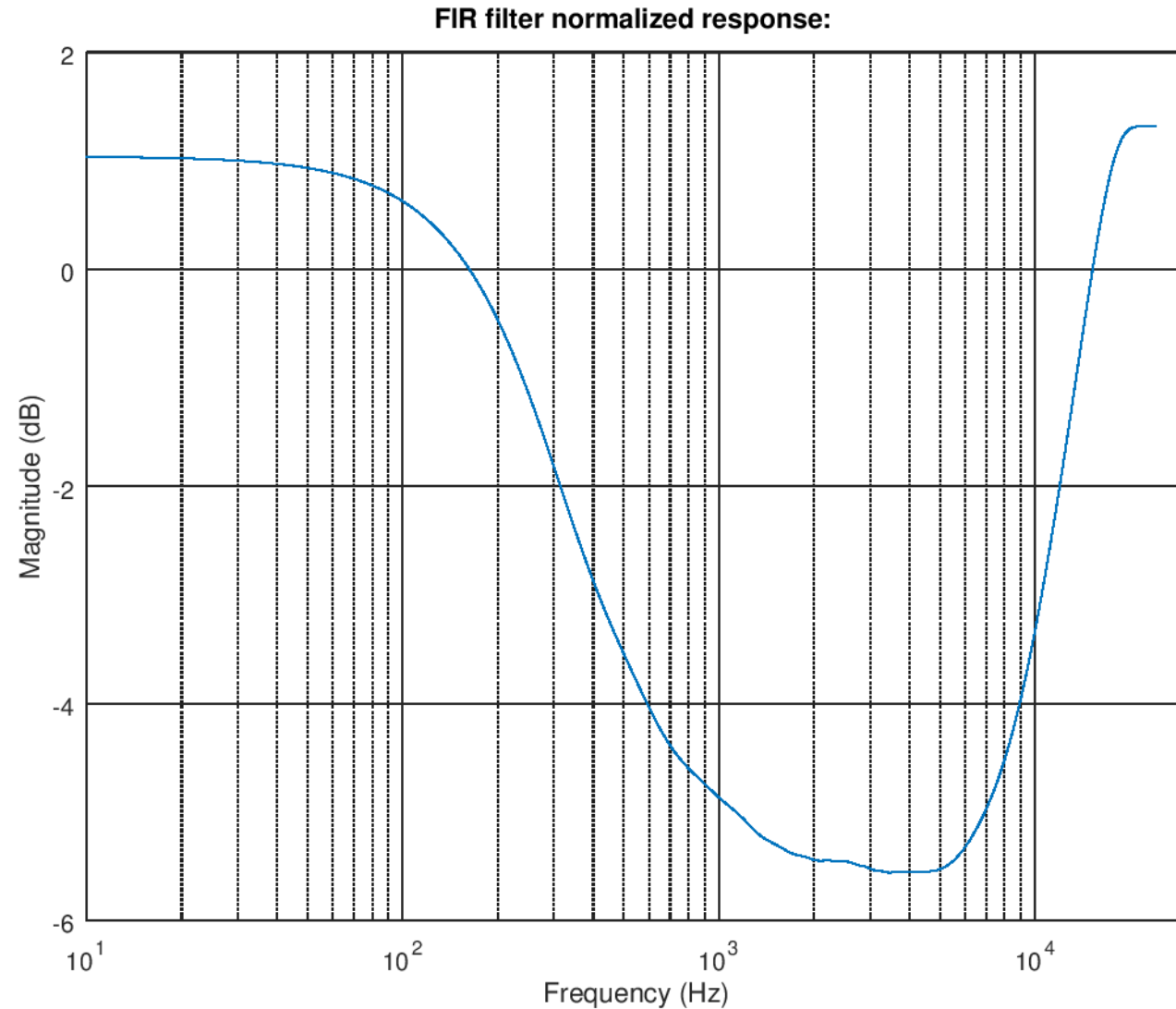
EQ Demo: Mid-Boost with FIR

- A ~100 tap FIR with a parametric EQ shape as design target
- Target was low-shelf at 1 kHz and high-shelf at 7 kHz, both 2nd order, -12 dB gain



EQ Demo: Loudness Effect with FIR – Target Delta of Two Subjective Equal Loudness Contours

- A ~140 tap filter, automatic design
- Can you hear/see difference to similar IIR design?



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