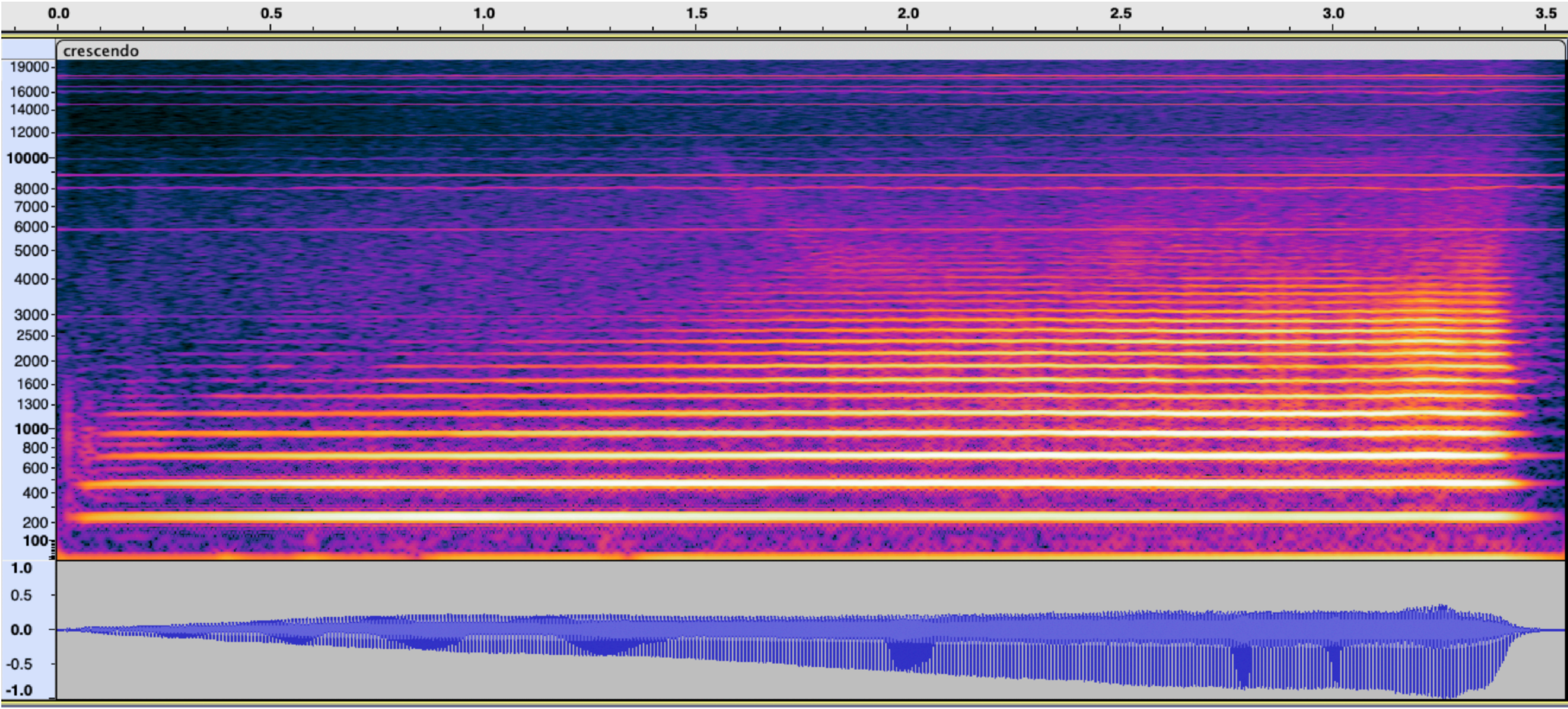


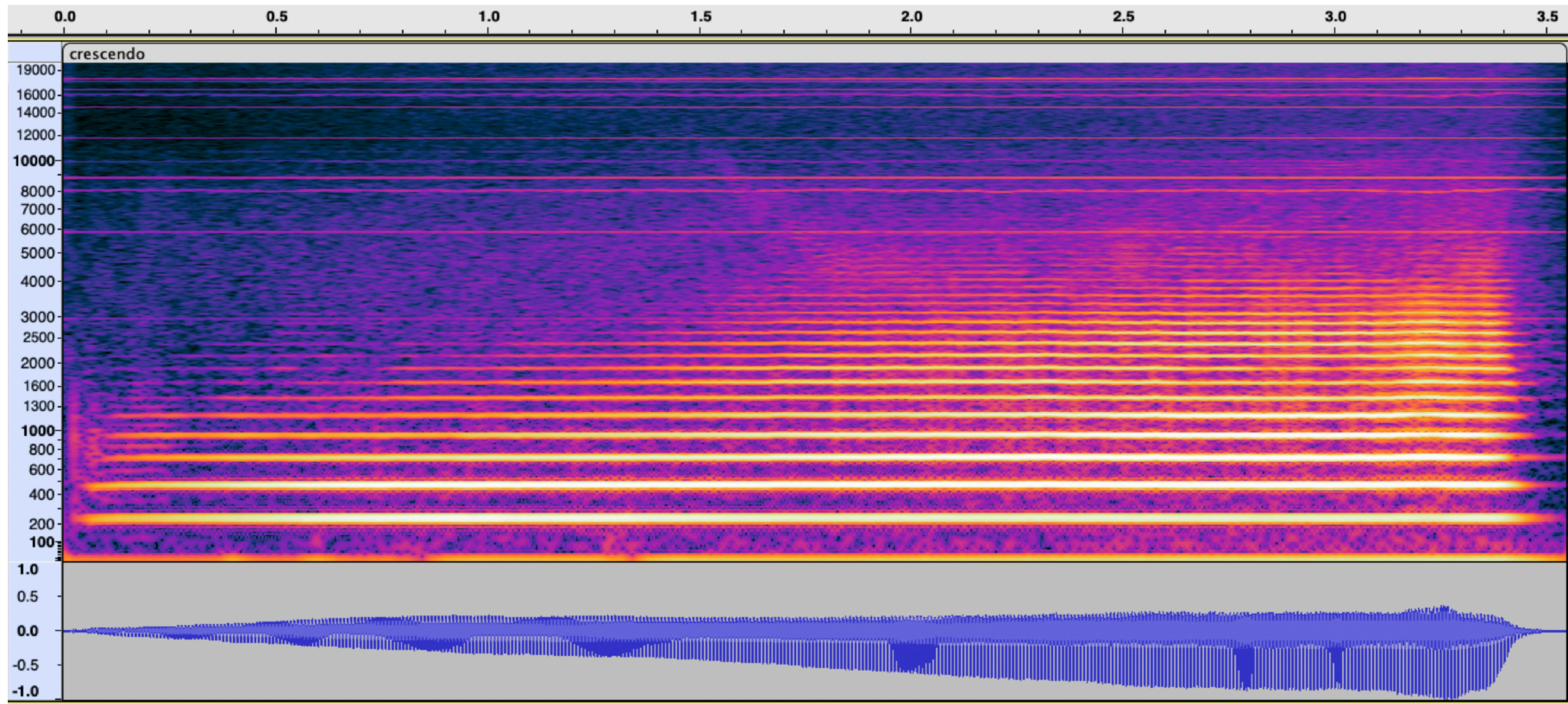
Loadness vs intensity

2

5



Loudness vs intensity



Decibel (dB)

- ▶ Decibel: a logarithmic unit used to measure sound level - difference as a ratio
- ▶ Example: One loudspeaker plays a sound with power P_1 , and another plays a louder version of the same sound with power P_2 , but everything else (how far away, frequency) kept the same

$$10 \log(P_2/P_1) \text{dB}$$

- P_2 is twice as much power than P_1

$$10 \log(P_2/P_1) = 10 \log(2) \approx 3 \text{dB}$$

- P_2 has *a million times* the power of P_1

$$10 \log(P_2/P_1) = 10 \log 1,000,000 \approx 60 \text{dB}$$