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, (Quantization Error)

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Dithering

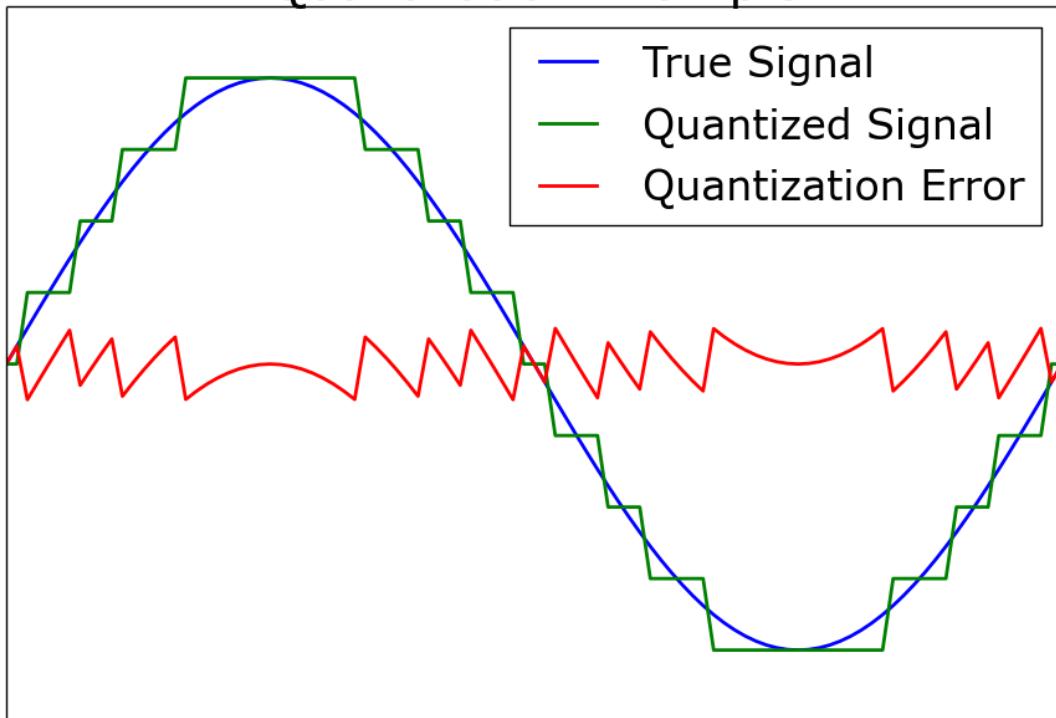
Dithering is an important technique used in digital audio processing to manage quantization error and enhance the quality of audio signals. In digital audio, continuous analog signals are represented in a digital format, and this involves expressing a finite amount of information using a limited number of bits. For example, a 16-bit representation of audio can only represent approximately 65,536 different values. Consequently, discrepancies arise between the continuous analog signal and its digital representation, which is referred to as quantization error.

Dithering involves adding small random noise to the audio signal. This noise mixes with the quantization error, making the audio signal sound more natural and reducing the noise that occurs during the conversion from digital to analog.

Dithering is primarily used in the digital audio mastering process when converting audio from a digital format to analog output or to another digital system. This process results in a more natural sound quality, improves audio fidelity, and reduces distortion caused by quantization error.

Quantization error

Quantization Example

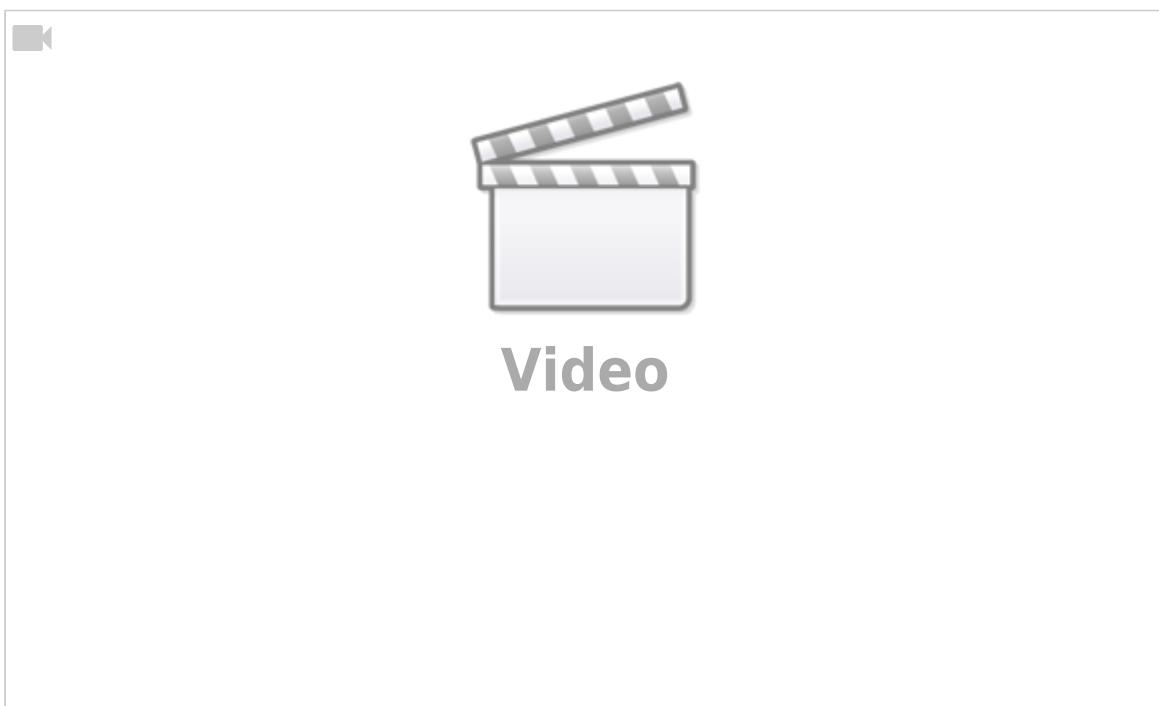


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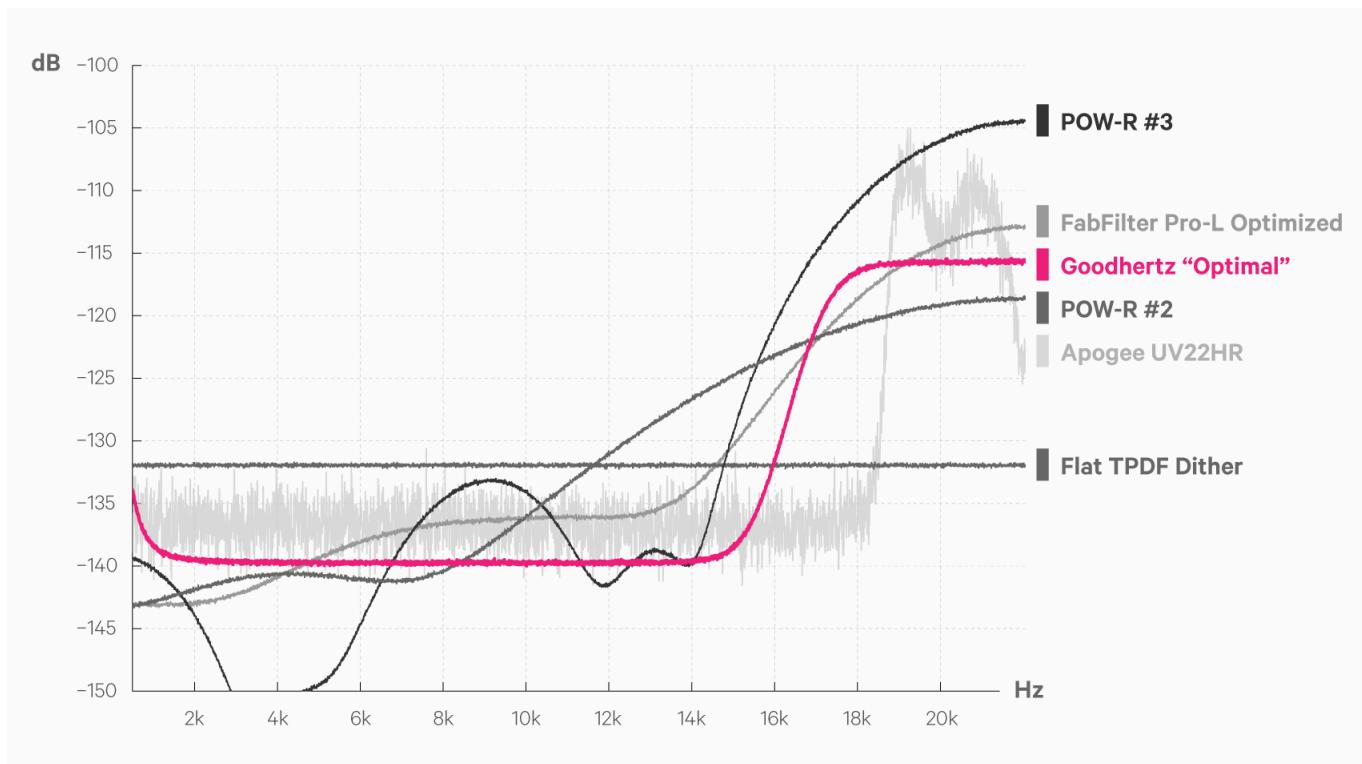
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