

## Efficient Alias-Free Level Crossing Sampling

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**Abstract :** This paper proposes strategies in level crossing (LC) sampling and reconstruction that provide alias-free high-fidelity signal reconstruction for speech signals without exponentially increasing sample number with increasing bit-depth. We introduce methods in LC sampling that reduce the sampling rate close to the Nyquist frequency even for large bit-depth. The results indicate that larger variation in the sampling intervals leads to an alias-free sampling scheme; this is achieved by either reducing the bit-depth or adding jitter to the system for high bit-depths. In conjunction with windowing, the signal is reconstructed from the LC samples using an efficient Toeplitz reconstruction algorithm.

**Keywords :** alias-free, level crossing sampling, spectrum, trigonometric polynomial

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