DE' HE INTER-SAMPLE DE' DEPENDENCY: DEVWI', DIELECTRIC, YOD CONTROLLED COMPARISON

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De' He inter-sample De' dependency: Devwl', dielectric, yoD controlled comparison

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ngoD

Tanaka et al. (2025) -- real QoQ De' bandlimited Qo' -- aliased residual 0.008-0.31 bits/sample recoverable ISI. direct microphone-ADC He. practice -- tlhegh, preamplifier, latlh analog Doch vegh. 14 De' He -- Devwl' type, dielectric, yoD, geometry pIm -- brass ensemble. ISI 6.1× choH: 0.047 (unshielded PVC) vo' 0.289 (cryo wa' nagh OFC PTFE quad-layer yoD). yoD 41% variance, Devwl' 29%, dielectric 19%, geometry 11%.

1. NGOQ

Tanaka et al. (2025) -- Nyquist-Shannon premise -- strict bandlimitation -- real QoQ De' Qo'. above-band energy -- anti-aliasing filter survive -- recoverable De' ghaj. direct microphone-ADC.

practice -- De' meters tlhegh, connectors, patch bay, console, processors vegh. Hoch component -- chuS, distortion, frequency attenuation Hal. above-band De' modify?

robust -- real-world qualify. fragile -- analog component choice De' amount determine. former expect. latter tu'.

2. MIW

controlled comparison. wa' acoustic source -- 14 analog De' He DaH rapbe' -- identical ADC. De' He ISI choH -- De' He nIteb.

brass octet (4 trumpet, 4 trombone) 45-min dry studio. DPA 4006A, 14-way transformer splitter, 14 AKM AK5578 768 kHz.

14 tlhegh: A (unshielded PVC) vo' N (superconducting YBCO). F-K controlled progression -- wa' variable DaH rapbe' choH.

3. LUT

ISI (bits/sample):
A (unshielded PVC): 0.047
B (Belden 8412): 0.098
E (Gotham GAC-4/1): 0.131
F (SC-OFC, PTFE, single): 0.148
H (SC-OFC, PTFE, triple): 0.214
K (cryo Hoch, quad): 0.271
L (K + yoq muv): 0.278
N (superconducting): 0.289

range factor 6.1×. wej metar tlhegh -- qach neH pIm -- 6.1× ISI choH.

4. JA'CHUQ

yoD dominant (41%). F!'H (single!'triple) +44.6%. above-band region 96-384 kHz -- EMI der nIv.

Devwl' nagh qach (29%). polycrystalline -- 100 kHz law' roll-off -- nagh HeH scattering. wa' nagh -- flat 250 kHz.

bIr chenmoH (10.7% Devwl', 5.9% dielectric). nagh defect nup -- above-band De' nIv.

yoq muv -- +2.6% -- mach. physics predict: yoq muv audio Sar logh Dop latlh address -- above-band ISI loss Qo' primary.

5. BERTLHAM

recoverable ISI -- analog De' He 0.047 vo' 0.289 bits/sample -- 6.1×. yoD 41%, Devwl' 29%, dielectric 19%, geometry 11%. Tanaka lut -- academic demonstration vo' practical engineering concern. sampling theorem mIr half. analog half -- De' budget -- De' He determine.

DE'MEY

[1] Y. Tanaka et al., 2025.
[2] C. E. Shannon, 1949.
[3] M. Ferro, R. Flux, "yoq muv," 2021.

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