

SICER - TASL

Abbreviations

- GT: Ground Truth
- NC: No Correction (No correction against sound speed change)
- SICER: Sinc Interpolation-Compression/Expansion-Resampling (Proposed Method)

▼ SZC with Simulated RIRs, SICER Corrected & Tested using Simulated RIRs

▼ Simulation Setup

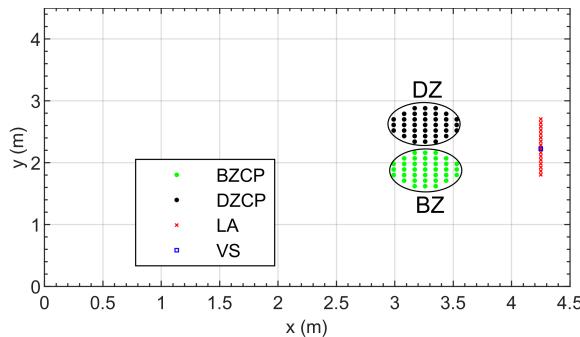


Fig.1. Top view of the room setup. BZCP: BZ Control Points, DZCP: DZ Control Points, LA: 16 Loudspeaker Array, VS: Virtual Source (the 8th loudspeaker in LA). $RT_{60} = 300\text{ms}$

▼ Performance Metrics

▼ Time domain acoustic contrast

$$\text{TD AC} = \frac{K_d (\mathbf{y}^{(BZ)})^T \mathbf{y}^{(BZ)}}{K_b (\mathbf{y}^{(DZ)})^T \mathbf{y}^{(DZ)}}$$

$$\text{TD nSDP} = \frac{\|\mathbf{d} - \mathbf{y}^{(BZ)}\|^2}{\|\mathbf{d}\|^2}$$

▼ Frequency domain acoustic contrast

$$\text{FD AC}(f) = \frac{K_d \sum_{k=1}^{K_b} |Y_k^{(BZ)}(f)|^2}{K_b \sum_{k=1}^{K_d} |Y_k^{(DZ)}(f)|^2}$$

▼ Frequency domain normalized signal distortion

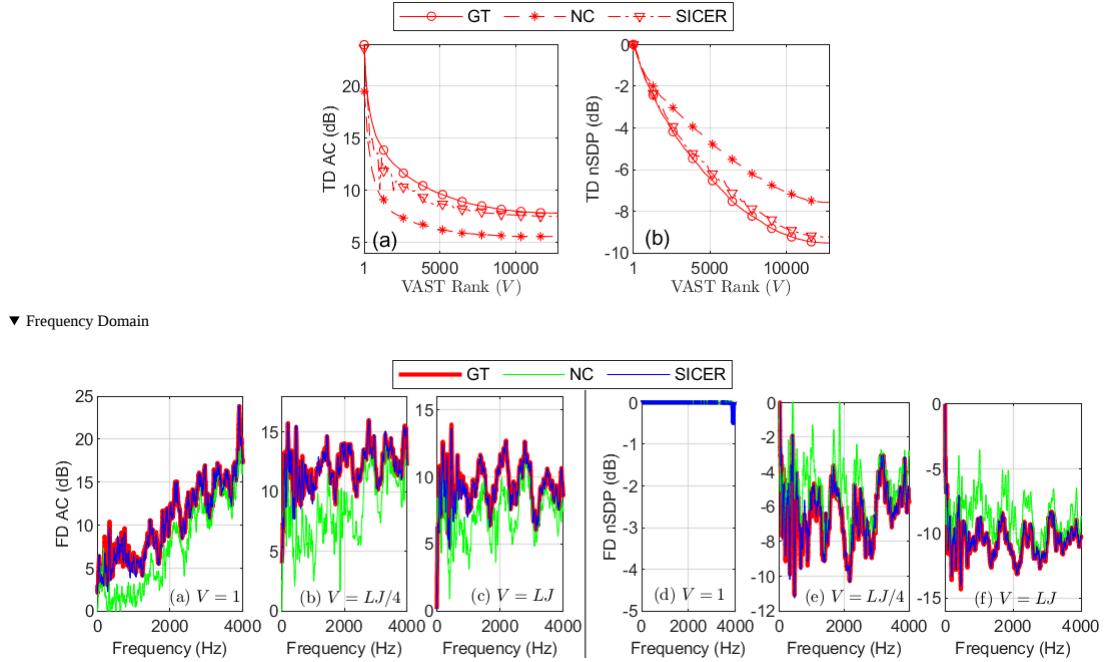
$$\text{FD nSDP}(f) = \frac{\sum_{k=1}^{K_b} |Y_k^{(BZ)}(f) - D_k(f)|^2}{\sum_{k=1}^{K_b} |D_k(f)|^2}$$

Input = $\delta(n)$

▼ CASE I : Speed Reduction

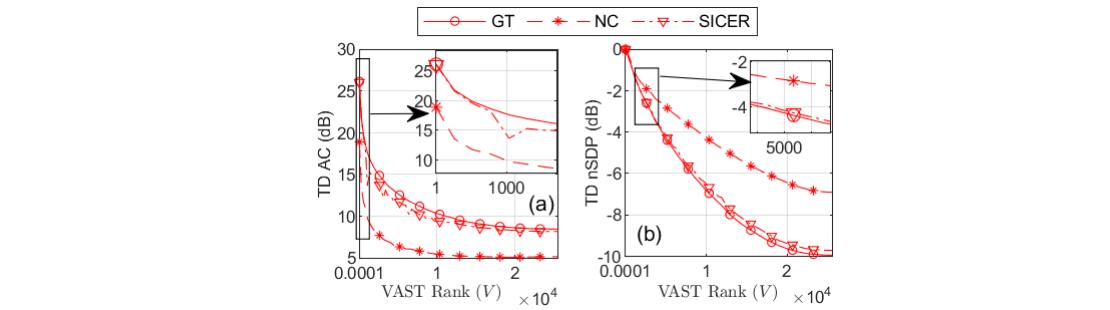
▼ $J = 800$

▼ Time Domain

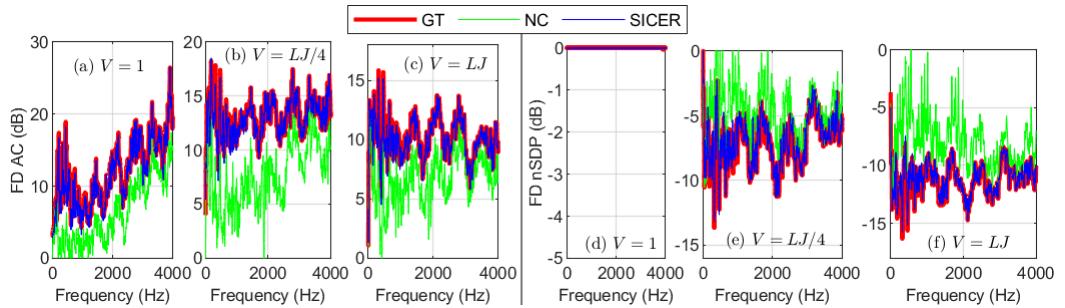


▼ $J = 1600$

▼ Time Domain



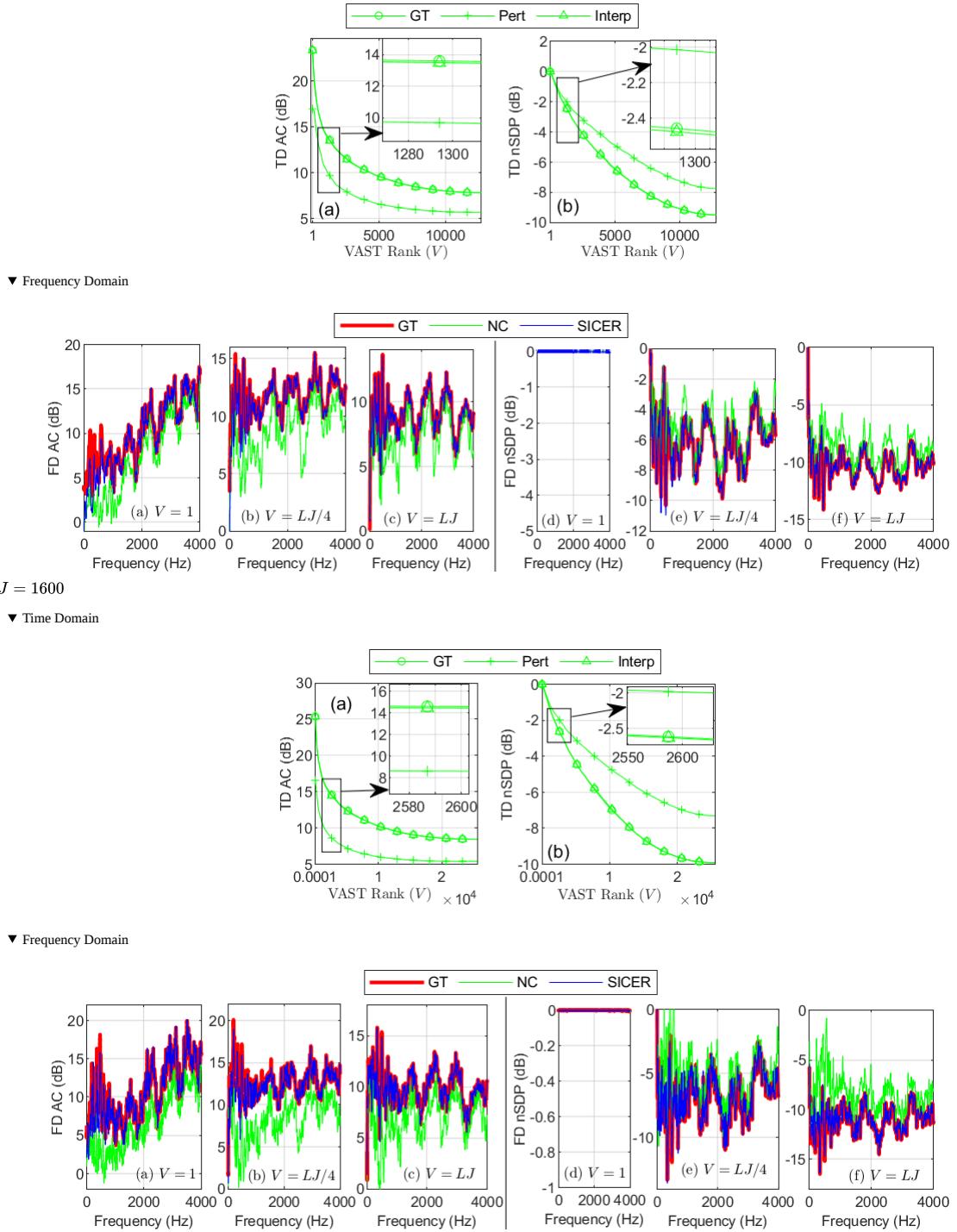
▼ Frequency Domain

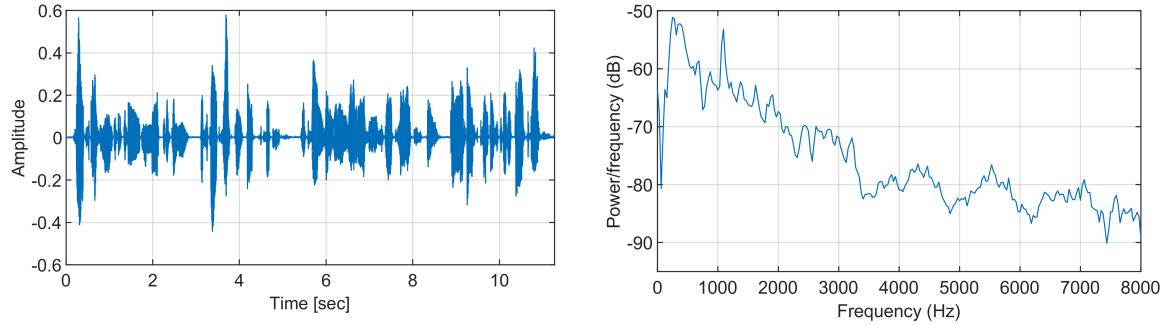


▼ CASE II: Speed Increase

▼ $J = 800$

▼ Time Domain

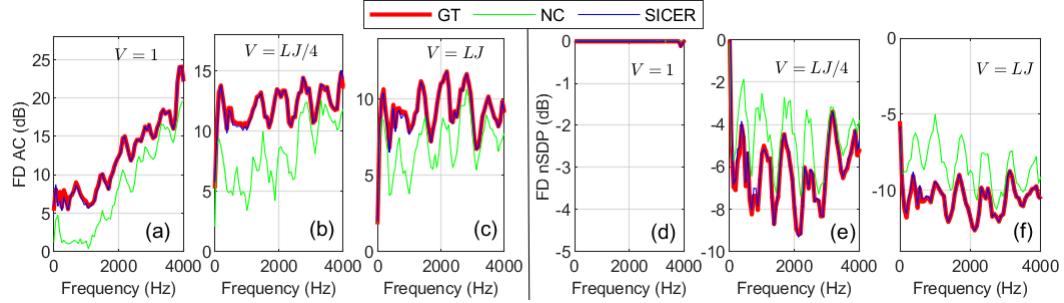




▼ CASE I : Speed Reduction

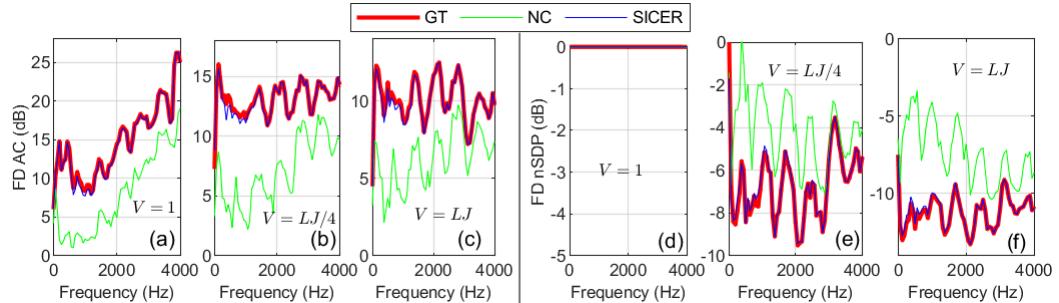
▼ $J = 800$

Frequency Domain



▼ $J = 1600$

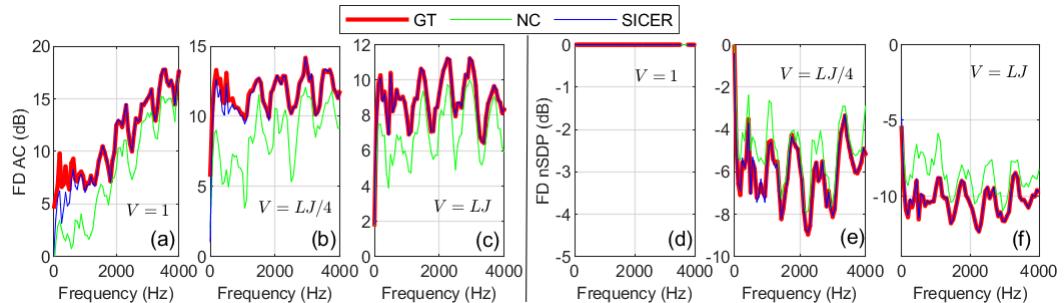
Frequency Domain



▼ CASE II: Speed Increase

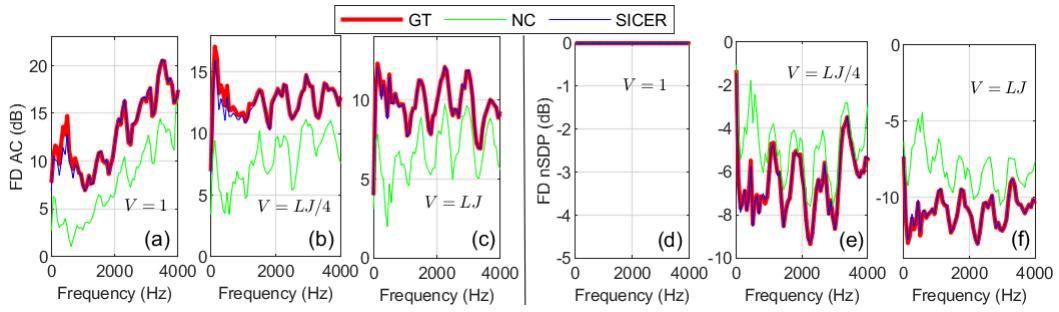
▼ $J = 800$

Frequency Domain



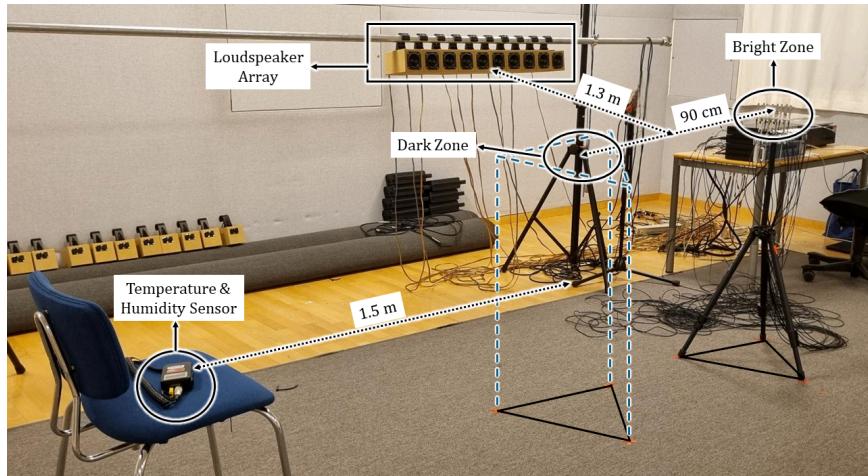
▼ $J = 1600$

Frequency Domain



▼ 🔔 SZC with Measured RIRs, SICER Corrected & Tested using Measured RIRs

▼ Setup used for Measuring Practical RIRs

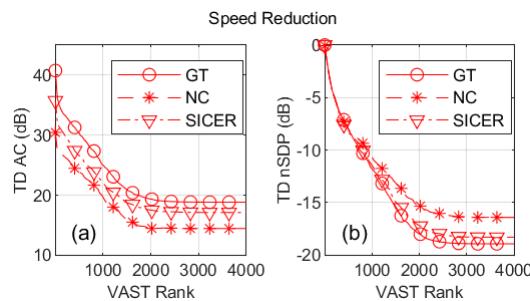


Input = $\delta(n)$

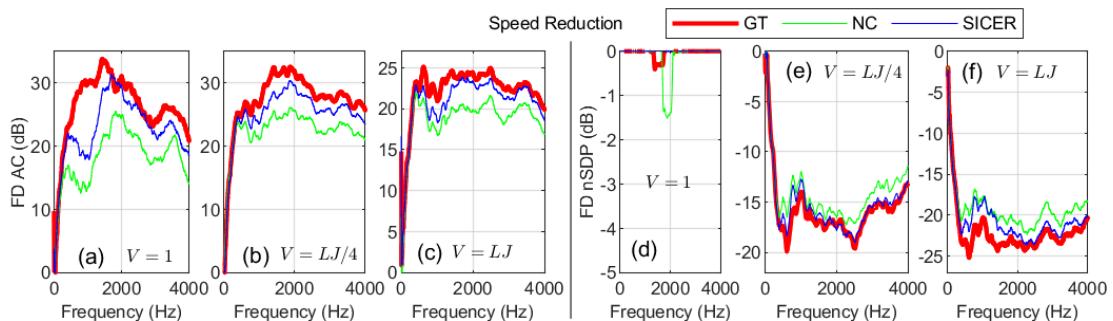
▼ CASE I : Speed Reduction

▼ $J = 400$

▼ Time Domain

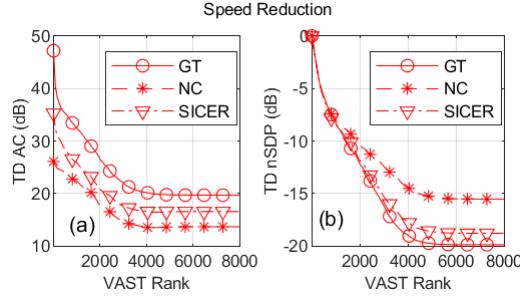


▼ Frequency Domain

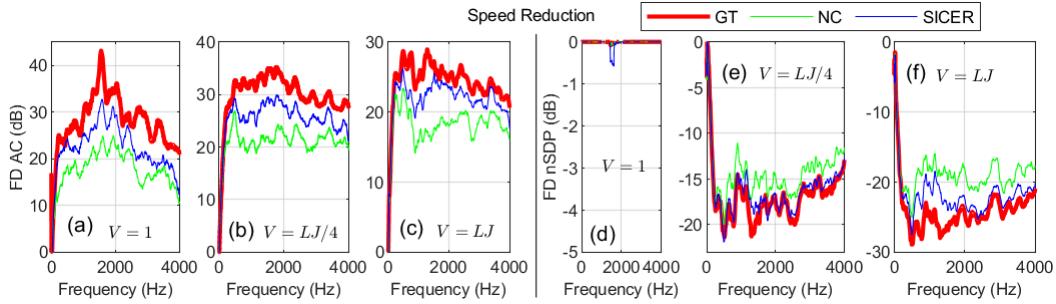


▼ $J = 800$

▼ Time Domain

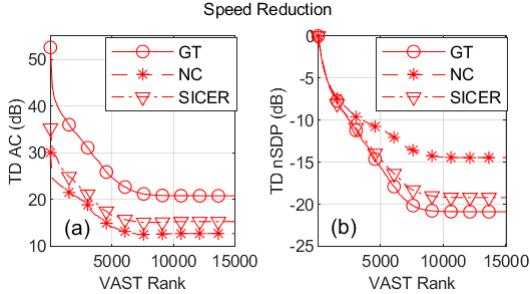


▼ Frequency Domain

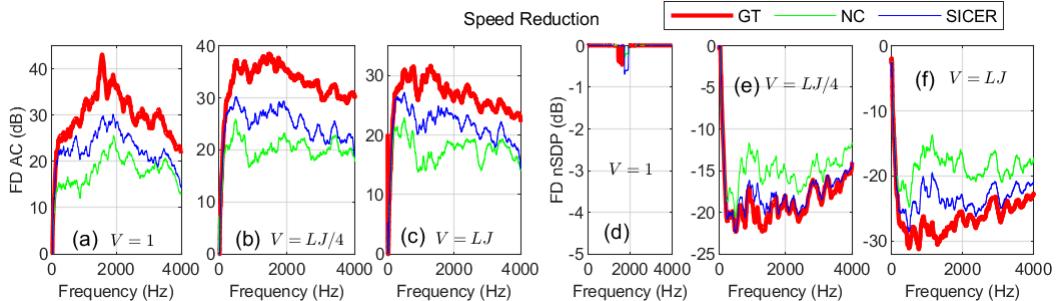


▼ $J = 1500$

▼ Time Domain



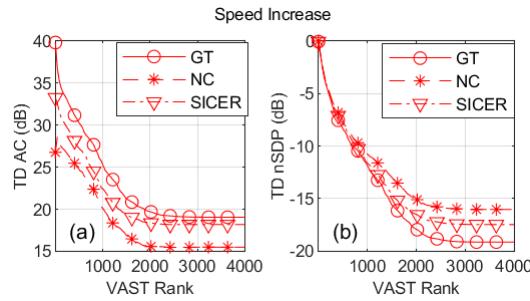
▼ Frequency Domain



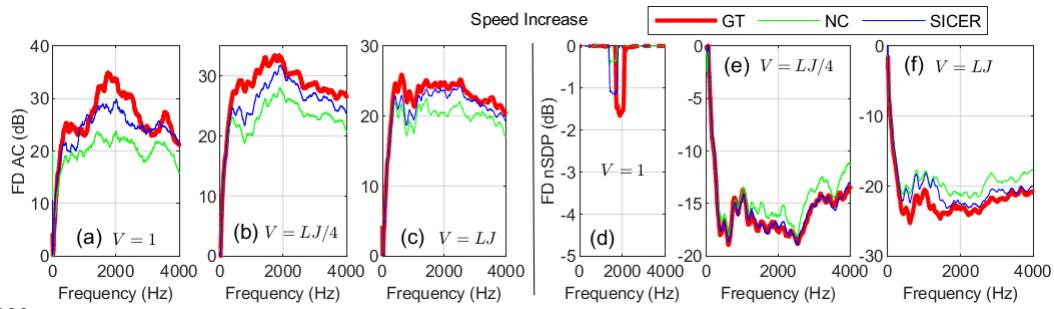
▼ CASE II: Speed Increase

▼ $J = 400$

▼ Time Domain

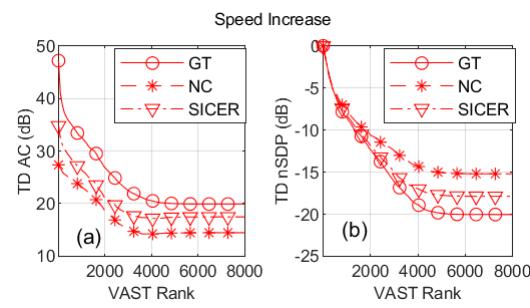


▼ Frequency Domain

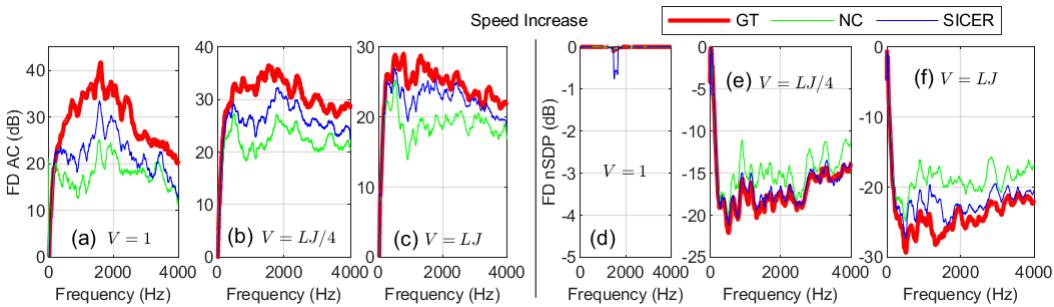


▼ $J = 800$

▼ Time Domain

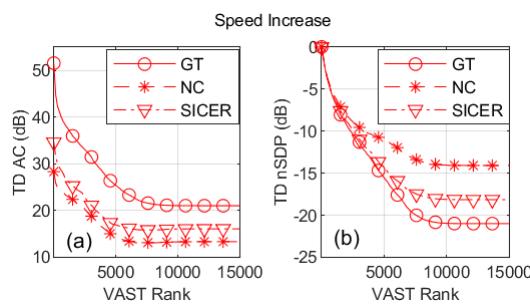


▼ Frequency Domain

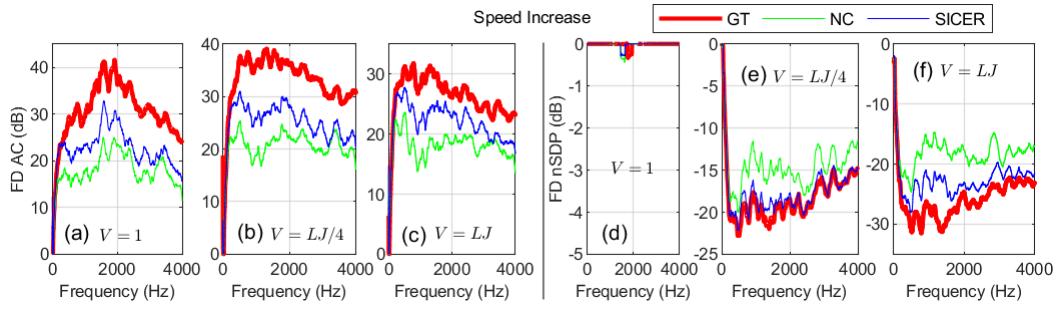


▼ $J = 1500$

▼ Time Domain

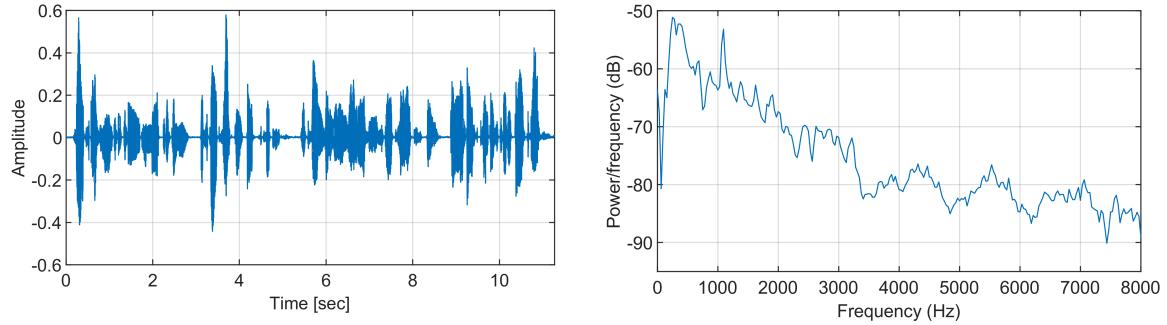


▼ Frequency Domain



Input = Speech Signal

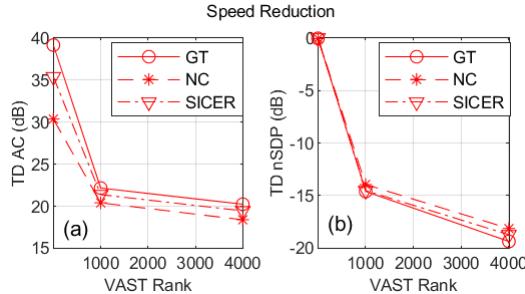
▼ Input Speech Signal



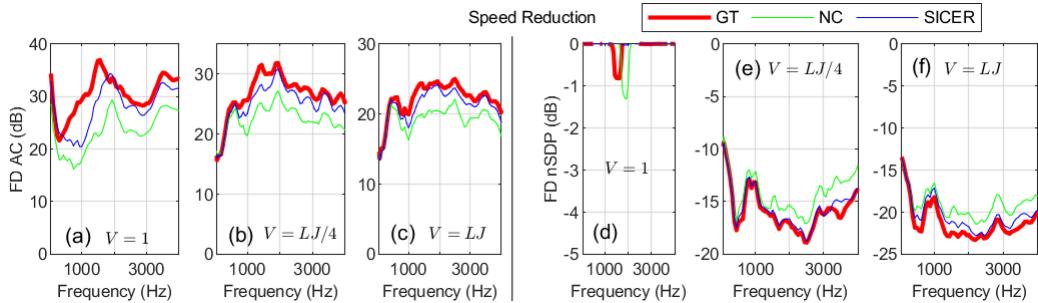
▼ CASE I : Speed Reduction

▼ $J = 400$

▼ Time Domain

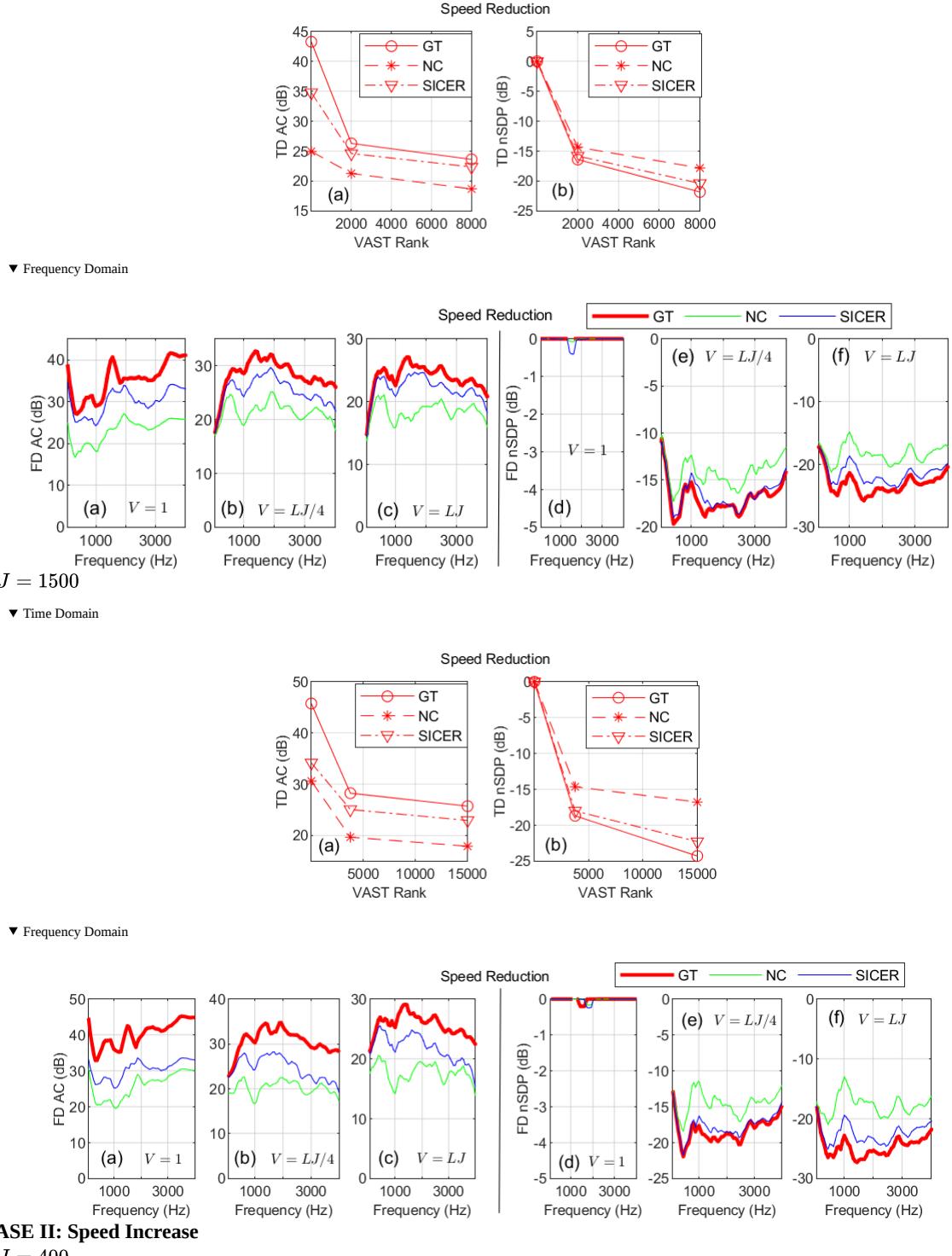


▼ Frequency Domain



▼ $J = 800$

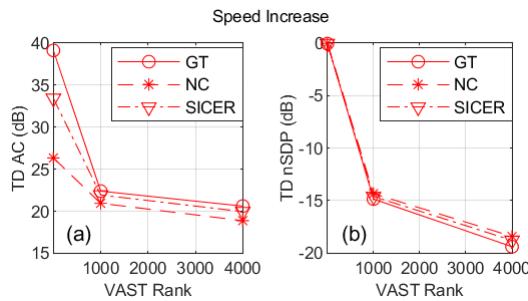
▼ Time Domain



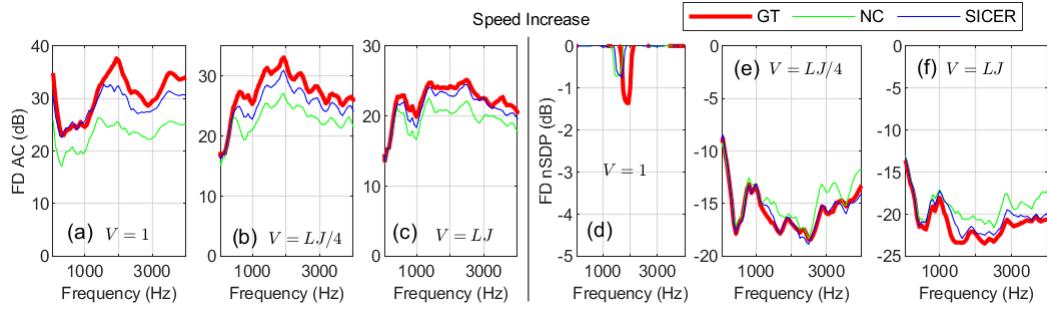
▼ CASE II: Speed Increase

▼ $J = 400$

▼ Time Domain

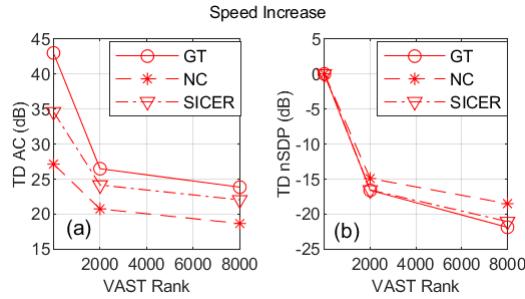


▼ Frequency Domain

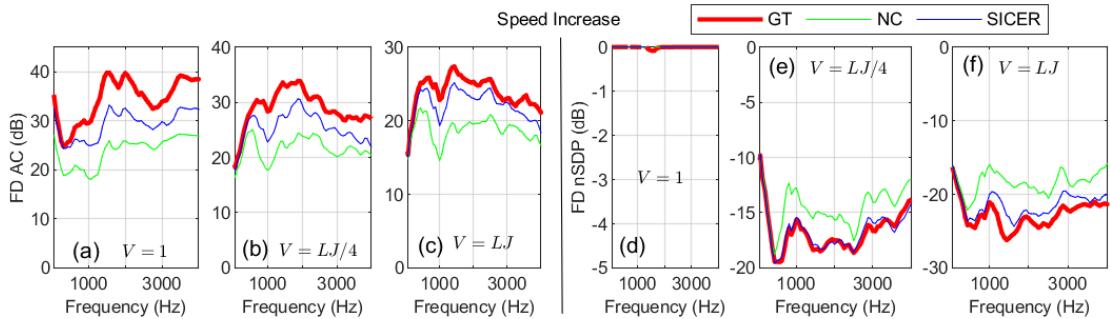


▼ $J = 800$

▼ Time Domain

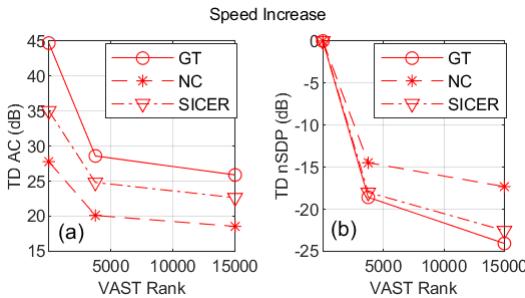


▼ Frequency Domain



▼ $J = 1500$

▼ Time Domain



▼ Frequency Domain

