

Fig. 1. MSE vs. SNR. n=5

REFERENCES

- Z. Yang, L. Xie, and C. Zhang, "A discretization-free sparse and parametric approach for linear array signal processing," *IEEE Transactions on Signal Processing*, vol. 62, no. 19, pp. 4959–4973, 2014.
- [2] M. Wang, Z. Zhang, and A. Nehorai, "Grid-less DOA estimation using sparse linear arrays based on wasserstein distance," *IEEE Signal Process*ing Letters, vol. 26, no. 6, pp. 838–842, 2019.
- [3] X. Wu, X. Yang, X. Jia, and F. Tian, "A gridless DOA estimation method based on convolutional neural network with Toeplitz prior," *IEEE Signal Processing Letters*, vol. 29, pp. 1247–1251, 2022.
- [4] A. Barthelme and W. Utschick, "DoA estimation using neural network-based covariance matrix reconstruction," *IEEE Signal Processing Letters*, vol. 28, pp. 783–787, 2021.
- [5] S. U. Pillai, Y. Bar-Ness, and F. Haber, "A new approach to array geometry for improved spatial spectrum estimation," *Proceedings of the IEEE*, vol. 73, no. 10, pp. 1522–1524, 1985.
- [6] K.-L. Chen and B. D. Rao, "A comparative study of invariance-aware loss functions for deep learning-based gridless direction-of-arrival estimation," in *International Conference on Acoustics, Speech and Signal Processing*. IEEE, 2025.
- [7] K.-L. Chen and B. D. Rao, "Subspace representation learning for sparse linear arrays to localize more sources than sensors: A deep learning methodology," *IEEE Transactions on Signal Processing*, vol. 73, pp. 1293–1308, 2025.