**Machine-learning enhanced quantum state tomography for non-Gaussian states**

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With this talk, I will first illustrate the implementation of our machine-learning (ML) enhanced quantum state tomography (QST) for continuous variables, through the experimentally measured data generated from squeezed vacuum states [1], as an example of quantum machine learning [2]. Our recent progress will be demonstrated in applying such a ML-QST on Wigner currents [3], single-photon Fock state [4], optical cat state [5], Bayesian estimation for gravitational wave detectors [6, 7], and quantumness measure [8].

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[2] Alexey Melnikov, Mohammad Kordzanganeh, Alexander Alodjants, and RKL," Quantum Machine Learning: from physics to software engineering," Adv. in Phys. X (Review Article) 8, 2165452 (2023).

[3] Yi-Ru Chen, et al., "Experimental reconstruction of Wigner phase-space current," Phys. Rev. A 108, 023729 (2023).

[4] Hsien-Yi Hsieh, et al., "Neural network enhanced single-photon Fock state tomography," [arXiv: 2405.02812].

[5] Yi-Ru Chen, et al., "Generation of heralded optical `Schroedinger cat' states by photon-addition," [arXiv:2306.13011].

[6] Hsien-Yi Hsieh, et al., in preparation for publication (2024).

[7] Yuhang Zhao, et al., "Frequency-dependent squeezed vacuum source for broadband quantum noise reduction in advanced gravitational-wave detectors," Phys. Rev. Lett. 124, 171101 (2020); Editors' Suggestion; Featured in Physics.

[8] Ole Steuernagel and RKL, "Quantumness Measure from Phase Space Distributions," [arXiv: 2311.17399].