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Recent advances in 3D SRF cavity-based quantum computing facility at the Fermilab SQMS Center

Monday 22 September 2025 09:50 (20 minutes)

This talk will describe the most recent advances and progress in building an SRF cavity-based quantum computing facility at the Fermilab SQMS center. Several technical challenges had been successfully overcome to preserve the highest quality factors of SRF cavities in the presence of the sapphire chip holding the transmon qubit inside the cavity. The record values of the attained multicell cavity (2-cell, 9-cell)-qubit systems will be presented, as well as a variety of quantum operations realized with such systems, including the generation of large Fock states, coherent states, entangled mode-mode states etc. The quantum algorithms and computational problems being implemented on this 3D SQMS QPUs will be discussed as well.

I have read and accept the Privacy Policy Statement

Footnotes

Funding Agency

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