Contribution ID: **206** Type: **Poster**

【567】Compact On-chip Vacuum Gap Transmon Qubits on Suspended SOI Membrane

Tuesday 31 August 2021 19:05 (1 minute)

Transmon qubits require a large shunt capacitance to decrease the sensitivity to charge fluctuations. It is usually realized by very large capacitor plates, which increase the coherence due to decreased coupling to parasitic losses localized in material interfaces but it lowers the achievable integration density and increases parasitic cross coupling. We achieve the large capacitance by narrow (≥100nm) vacuum gaps micro-machined on suspended silicon membranes. The finger capacitor has 99.6% of the electric field energy stored in vacuum and effective permittivity close to unity. The result is a compact on-chip transmon qubit with state of the art coherence per footprint area and losses limited by metal surface impurities.

Primary author: ZEMLICKA, Martin (Martin Zemlicka)

Co-authors: REDCHENKO, Elena; PERUZZO, Matilda; HASSANI, Farid; BARZANJEH, Shabir; FINK, Johannes

Presenter: ZEMLICKA, Martin (Martin Zemlicka)

Session Classification: Poster Session

Track Classification: Quantum Information and Quantum Computing