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High impedance lumped element nanoresonators for quantum dot circuit quantum electrodynamics[1] S. PUTZ, F. BORJANS, X. MI, J. R. PETTA, Department of Physics, Princeton University — The strength of vacuum voltage fluctuations in an LC circuit is proportional to its impedance Z. Therefore, increasing the impedance of superconducting resonators well above the standard impedance of $Z = 50\,\Omega$ will allow for increased coupling rates between cavity photons and single electrons in gate defined quantum dots. Alternative to using ultra high kinetic inductance materials and distributed circuits to achieve high impedance[2], I will present a new approach based on planar lumped element nanoresonators. The presented devices consist of nanowires fabricated from a 15 nm thick Nb film that is sputtered onto high resistivity silicon. The nanoresonators with $Z \sim 1$ kΩ enable the versatile design of multiqubit arrays coupled to a single mode cavity.

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[2]N. Samkharadze *et al.*, Phys. Rev. Applied **5**, 044004 (2016)

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