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Materials Effects in 3D-Cavity Transmon Qubits DANIELA F. BOGORIN, MATTHEW WARE, STEPHEN SOROKANICH, B.L.T. PLOURDE, Syracuse University, Physics Department — Recent experiments have demonstrated significant increases in the coherence of superconducting transmon qubits coupled to three-dimensional microwave cavities. We are investigating the effects of different materials for forming such cavities, as well as various surface treatments of the cavity walls, including electropolishing and electroplating. In addition, we are exploring the influence of the superconducting material that forms the qubit capacitor along with the material that forms the substrate on which the qubit is fabricated.

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