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Disorder in a Kagome Lattice of Superconducting Coplanar Waveguide Resonators[1] DEVIN UNDERWOOD, WILL SHANKS, ANTHONY HOFFMAN, Department of Electrical Engineering, Princeton University, JENS KOCH, Department of Physics and Astronomy, Northwestern University, ANDREW HOUCK, Department of Electrical Engineering, Princeton University — It has been proposed that arrays of electromagnetic cavities, coupled to two level quantum systems can be used to realize quantum phase transitions of polaritons. One possible experimental realization is a circuit quantum electrodynamics architecture, in which transmon qubits are coupled to superconducting coplanar waveguide resonators (CPWRs); however, for this to be successful, arrays of resonators must be fabricated with low disorder. Results will be reported on characterization of an array of 12 niobium resonators on a sapphire substrate in a honeycomb pattern with the photonic lattice sites forming a Kagome star. These arrays were characterized by measuring many devices of the same design, and using statistical methods for analysis. Furthermore we investigate the origins of disorder, and its dependence on fluctuations in the CPWR geometry.

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Devin Underwood
Department of Electrical Engineering, Princeton University

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