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Autler-Townes effect in a superconducting three-level system MIKA SILLANPAA, JIAN LI, Helsinki University of Technology, Finland, KATA-RINA CICAK, FABIO ALTOMARE, JAE PARK, RAYMOND SIMMONDS, NIST, Boulder CO, SORIN PARAOANU, PERTTI HAKONEN, Helsinki University of Technology, Finland — When a three-level quantum system is irradiated by an intense coupling field resonant with one of the three possible transitions, the absorption peak of an additional probe field involving the remaining level is split. This process is known in quantum optics as the Autler-Townes effect. We observe these phenomena in a superconducting Josephson phase qubit, which can be considered an "artificial atom" with a multilevel quantum structure. The spectroscopy peaks can be explained reasonably well by a simple three-level Hamiltonian model. Simulation of a more complete model (including dissipation, higher levels, and cross-coupling) provides excellent agreement with all the experimental data.

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