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The dynamical Casimir effect in a superconducting coplanar waveguide J. ROBERT JOHANSSON, RIKEN, GÖRAN JOHANSSON, Chalmers University of Technology, CHRIS WILSON, FRANCO NORI, RIKEN — We investigate the dynamical Casimir effect in a coplanar waveguide (CPW) terminated by a superconducting quantum interference device (SQUID). Changing the magnetic flux through the SQUID parametrically modulates the boundary condition of the CPW, and thereby, its effective length. Effective boundary velocities comparable to the speed of light in the CPW result in broadband photon generation which is identical to the one calculated in the dynamical Casimir effect for a single oscillating mirror. We estimate the power of the radiation for realistic parameters and show that it is experimentally feasible to directly detect this nonclassical broadband radiation.

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