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Microwave spectroscopy of Majorana bound states in S/TI/S junctions JUKKA VAYRYNEN, Department of Physics, Yale University, GIANLUCA RASTELLI, WOLFGANG BELZIG, Fachbereich Physik, Universität Konstanz, LEONID GLAZMAN, Department of Physics, Yale University — We study the effects of microwave irradiation in a phase-biased topological Josephson junction, consisting of two s-wave superconductors linked by a quantum-spin-Hall insulator edge. A long topological junction supports multiple Andreev bound states, one of which (Majorana mode) has zero energy at phase difference $\phi = \pi$. We consider weak time-periodic modulation of the phase difference to study transitions between the discrete sub-gap levels of the junction. In a generic disordered junction all the degeneracies of single-particle levels are lifted but the zero-energy state remains and leads to a ground state degeneracy at $\phi = \pi$. Upon sweeping ϕ across the ground state degeneracy point, we show that the lowest excitation energy of the junction displays a prominent kink which can be observed in the absorption spectrum. To study this feature, we calculate the absorption power as a function of frequency, phase difference, and at finite temperature.

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