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**Josephson radiation from InSb-nanowire junction**<sup>1</sup> DAVID VAN WOERKOM, ALEXANDER PROUTSKI, TAMAS KRIVACHY, DANIEL BOUMAN, RUBEN VAN GULIK, ONDER GUL, MAJA CASSIDY, Delft Univ. of Tech., The Netherlands, DIANA CAR, ERIK BAKKERS, Eindhoven Univ. of Tech., The Netherlands, LEO KOUWENHOVEN, ATTILA GERESDI, Delft Univ. of Tech., The Netherlands — Semiconducting nanowire Josephson junctions has recently gained interest as building blocks for Majorana circuits and gate-tuneable superconducting qubits . Here we investigate the rich physics of the Andreev bound state spectrum of InSb nanowire junctions utilizing the AC Josephson relation  $2eV_{\text{bias}} = \hbar f$  . We designed and characterized an on-chip microwave circuit coupling the nanowire junction to an Al/AlO<sub>x</sub>/Al tunnel junction. The DC response of the tunnel junction is affected by photon-assisted quasiparticle current, which gives us the possibility to measure the radiation spectrum of the nanowire junction up to several tens of GHz in frequency. Our circuit design allows for voltage or phase biasing of the Josephson junction enabling direct mapping of Andreev bound states. We discuss our fabrication methods and choice of materials to achieve radiation detection up to a magnetic field of few hundred milliTesla, compatible with Majorana states in spin-orbit coupled nanowires.

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