

Abstract Submitted
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Electric dipole spin resonance measurement of spin-orbit anisotropy in InSb nanowire quantum dots SERGEY FROLOV, STEVAN NADJ-PERGE, VLAD PRIBIAG, JOHAN VAN DEN BERG, TU Delft, SEBASTIEN PLISSARD, TU Eindhoven, ERIK BAKKERS, LEO KOUWENHOVEN, TU Delft — Indium antimonide nanowires are considered a leading platform for the generation of Majorana fermion bound states, and as hosts of spin-orbit quantum bits based on single electrons. Both efforts are motivated by the strong spin-orbit interaction in the bulk InSb. Here we present measurements of the strength and orientation of the effective spin-orbit magnetic field in InSb nanowire double quantum dots. Spin-orbit interaction induces avoided level crossings between triplet (1,1) and singlet (0,2) double dot states. These avoided crossings are observed in the spectrum of the electric dipole spin resonance performed on strongly-coupled double dots. We find that the spin-orbit field is oriented perpendicular to the nanowire axis, and parallel to the substrate plane. This orientation is consistent with Rashba spin-orbit interaction and is favorable for Majorana experiments. The strength of spin-orbit interaction is characterized by the spin-orbit length which we estimate to be 200 nm. This translates into a temperature scale of 3K for the observation of Majorana states.

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