Wireless Majorana Fermions: From Magnetic Tunability to Braiding\textsuperscript{1} GEOFFREY FATIN, ALEX MATOS-ABIAGUE, BENEDIKT SCHARF, IGOR ZUTIC, University at Buffalo - SUNY — We propose a versatile platform to investigate the existence of zero-energy Majorana fermions (MFs) and their non-Abelian statistics through braiding [1]. This implementation combines a two-dimensional electron gas formed in a semiconductor quantum well grown on the surface of an $s$-wave superconductor, with a nearby array of magnetic tunnel junctions (MTJs). The underlying magnetic textures produced by MTJs provide highly-controllable topological phase transitions to confine and transport MFs in two dimensions, overcoming the requirement for a network of wires.


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