Reproducing sterile neutrinos and the behavior of flavor oscillations with superconducting-magnetic proximity effects[1] THOMAS E. BAKER[2], Department of Physics & Astronomy, University of California, Irvine — The physics of a superconductor subjected to a magnetic field is known to be equivalent to neutrino oscillations [1]. Examining the properties of singlet-triplet oscillations in the magnetic field, a sterile neutrino is suggested to be represented by singlet Cooper pairs and moderates flavor oscillations between three flavor neutrinos (triplet Cooper pairs) [2]. A superconductor-exchange spring [3] system's rotating magnetization profile is used to simulate the mass-flavor oscillations in the neutrino case and the physics of neutrino oscillations are discussed. Connecting the condensed matter system and the particle physics system with this analogy may allow for the properties of the condensed matter system to inform neutrino experiments. [1] Y. Pehlivan, A.B. Balantekin, T. Kajino, and T. Yoshida, *Invariants of collective neutrino oscillations*, Physical Review D **84**, 065008 (2011) [2] T.E. Baker, *Reproducing sterile neutrinos and the behavior of flavor oscillations with superconducting-magnetic proximity effects*, (arxiv:1601.00913) [3] T.E. Baker, A. Richie-Halford, and A. Bill, *Long range triplet Josephson current and 0-π transitions in tunable domain walls*, New Journal of Physics **16**, 093048 (2014)

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