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Effects of magnetic flux in a loop formed by an s-wave superconductor and an \( s_\pm \) superconductor ROSA RODRIGUEZ-MOTA, TAMI PEREG-BARNEA, McGill University — Identifying the correct order parameter structure of the iron based superconductors will provide insight into the pairing mechanism in these materials. Due to the multi-orbital band structure of these materials and the proximity of the superconducting phase to an anti-ferromagnetic phase, most theories favor magnetic fluctuations as the pairing mechanism and an order parameter with the so-called \( s_\pm \) symmetry. However, it is experimentally challenging to distinguish the \( s_\pm \) symmetry from conventional s-wave symmetry; thus, the \( s_\pm \) structure remains unconfirmed. In 2010, Chen et al showed evidence of integer and half integer flux quantum transitions in an Nb-NdFeAsO\(_{0.88}\)F\(_{0.12}\) loop excited by electromagnetic pulses [1]. We present a theoretical study of the effects of magnetic flux in a superconducting \( s/s_\pm \) loop inspired by these results. Our findings are in agreement with preliminary results of a phenomenological Ginzburg Landau model [2], and help clarify the relation between the transitions observed in the experiment and the \( s_\pm \) symmetry.


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