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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.

[1] C.-T. Chen *et al*, Nature Physics 6, 260 (2010).
[2] Berg, Lindner, Pereg-Barnea, Phys. Rev. Lett. 106, 1470.

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