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Possible time-reversal symmetry breaking pairing state in FeAs superconductors WEI-CHENG LEE, University of California, San Diego, SHOU-CHENG ZHANG, Stanford University, CONGJUN WU, University of California, San Diego — We investigate the competition between the extended s-wave and d-wave pairing order parameters in the iron-based superconductors. Because of the frustrating pairing interactions among the electron and the hole Fermi pockets, a time reversal symmetry breaking s+id pairing state could be favored. We analyze this pairing state within the Ginzburg-Landau theory, and explore the experimental consequences. In such a state, spatial inhomogeneity induces supercurrent near a non-magnetic impurity and the corners of a square sample. The resonance mode between the s and d-wave order parameters can be detected through the B_{1g}-Raman spectroscopy.

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