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Nematic quantum paramagnetic fluctuation mediated pairing in FeSe JIAN-HUANG SHE, Cornell University, MICHAEL LAWLER, Binghamton University, Cornell University, EUN-AH KIM, Cornell University — Despite its seemingly simple composition and structure, the pairing mechanism of FeSe remains an open problem due to several striking phenomena. Among them are nematic order without magnetic order, nodeless gap and extremely anisotropic momentum dependence of inelastic neutron spectra. Here we propose a microscopic description of a nematic quantum paramagnet that reproduces key features of neutron spectra with the key insight of viewing it as a sum over contributions from nematic domains. We then study how the spin fluctuation of the local moments lead to pairing within a spin-fermion model. We find the resulting superconducting order parameter is nodeless $s \pm d$-wave within each domain. Furthermore we predict the gap magnitude to be very anisotropic at each Fermi pocket in a manner that reflects the distribution of orbital contents.

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