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Superfluid pairing in a mixture of a spin-polarized Fermi gas and a dipolar condensate[1] BEN KAIN, Department of Physics, College of the Holy Cross, Worcester, MA 01610, HONG LING, Department of Physics, Rowan University, Glassboro, NJ 08028 — We consider a mixture of a spin-polarized Fermi gas and a dipolar Bose-Einstein condensate in which s-wave scattering between fermions and the quasiparticles of the dipolar condensate can result in an effective attractive Fermi-Fermi interaction anisotropic in nature and tunable by the dipolar interaction. We show that such an interaction can significantly increase the prospect of realizing a superfluid with a gap parameter characterized with a coherent superposition of all odd partial waves. We formulate, in the spirit of the Hartree-Fock-Bogoliubov mean-field approach, a theory which allows us to estimate the critical temperature when the anisotropic Fock potential is taken into consideration and study how to prepare the mixture in order to optimize the critical temperature at which such a superfluid emerges before the system starts to phase separate.

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