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Mixed triplet and singlet pairing in multicomponent fermion systems with dipolar interactions CONGJUN WU, JORGE HIRSCH, Department of Physics, University of California, San Diego, CA 92093 — The symmetry properties of the Cooper pairing problem for multi-component ultra-cold dipolar molecular systems are investigated. The dipolar anisotropy provides a natural and robust mechanism for both triplet and singlet Cooper pairing to first order in the interaction strength. With a purely dipolar interaction, the triplet p_z -like polar pairing is the most dominant. A short-range attractive interaction can enhance the singlet pairing to be nearly degenerate with the triplet pairing. We point out that these two pairing channels can mix by developing a relative phase of $\pm\frac{\pi}{2}$, thus spontaneously breaking time-reversal symmetry. We also suggest the possibility of such mixing of triplet and singlet pairing in other systems.

Congjun Wu
Physics Department, UCSD

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