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Superfluid excitations of dipolar fermi gases[1] PIOTR DEUAR, LPTMS, Universite Paris-sud/CNRS, Orsay, France, MIKHAIL BARANOV, Institut fur Theoretische Physik, Universitat Innsbruck, Austria, GEORGY SHLYAPNIKOV, LPTMS, Universite Paris-sud/CNRS, Orsay, France; WZI, Universiteit van Amsterdam, The Netherlands — The collective and single-particle excitations of a gas of fermionic dipoles have been determined for the case of a uniform, single-species, fully polarised gas below superfluid (BCS) critical temperature. Its behaviour, especially damping, differs strongly from the s-wave BCS gas due to a node line in its quasiparticle excitation spectrum that resembles that in the hypothetical polar phase of He-3 and exotic superconductors. One finds: (1) Anisotropic damping of collective modes even at T=0. (2) An "aligned superfluid" regime with no analogue in the s-wave-interacting gas, for excitations with energy well below kT. Here good quality superfluidity occurs only in directions concentrated broadly around the polarisation, whereas other directions are strongly damped. (3) Current response to external forcing of the gap is anisotropic and at an angle to the applied probe.

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