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Excitations of a vortex line in an elongated dipolar condensate P. BLAIR BLAKIE, AU-CHEN LEE, DANNY BAILLIE, University of Otago, RUSSELL BISSET, Leibniz Universität Hannover — We characterize the properties of a vortex line in an elongated dipolar BoseEinstein condensate. Increasing the strength of the dipole-dipole interactions (DDIs) relative to the short-ranged contact interactions we find that the system crosses over to a self-bound vortex droplet stabilized from collapse by quantum fluctuations. We calculate the quasiparticle excitation spectrum of the vortex state, which is important in characterizing the vortex response and assessing its stability. When the DDIs are sufficiently strong we find that the vortex is dynamically unstable to quadrupolar modes.

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