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Droplet crystal ground states of a dipolar Bose gas P BLAIR BLAKIE, DANNY BAILLIE, Dodd Walls Centre and Department of Physics, University of Otago, New Zealand — We show that the ground state of a dipolar Bose gas in a cylindrically symmetric harmonic trap has a rich phase diagram, including droplet crystal states in which a set of droplets arrange into a lattice pattern that breaks the rotational symmetry. An analytic model for small droplet crystals is developed and used to obtain a zero temperature phase diagram that is numerically validated. We show that in certain regimes a coherent low-density halo surrounds the droplet crystal giving rise to a novel phase with localized and extended features.

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