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**Pinning of vortices in a Bose-Einstein condensate by an optical lattice** J.W. REIJNDERS, University of Amsterdam, R.A. DUINE, The University of Texas at Austin — We consider the ground state of vortices in a Bose-Einstein condensate. We show that turning on a weak optical periodic potential leads to a transition from the triangular Abrikosov vortex lattice to phases where the vortices are pinned by the optical potential. We discuss the phase diagram of the system for a two-dimensional optical periodic potential with one vortex per optical lattice cell. We also discuss the influence of a one-dimensional optical periodic potential on the vortex ground state. The latter situation has no analogue in other condensed-matter systems.

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