

Abstract Submitted  
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**Vortex formation in a rotating reference frame**<sup>1</sup> MICHAEL RAY,  
THOMAS LANGIN, DAVID HALL, Amherst College — We create vortices in a  
trapped Bose-Einstein condensate by cooling the atomic sample through the phase  
transition in the presence of a rotating magnetic trapping potential. The thermal  
cloud remains in quasi-equilibrium during the cooling, ultimately producing con-  
densates in the rotating ground state. We show that the trap rotation frequency at  
which a vortex first appears agrees closely with theoretical predictions. The number  
of vortices within the condensate is established by the rotation frequency at the  
phase transition; once the condensate has started to form, its vortex content is ro-  
bust against frequency changes. Images of the condensate taken during evaporation  
suggest that the vortex spatial configuration is similarly determined early on in the  
growth of the condensate.

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