

# Vortices in rotating BECs

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Topological defects can be stabilized by rotation in a neutral superfluid. In a Bose-Einstein condensate (BEC) they are known as quantized vortices. Several features make rotating BECs a remarkable system for studying the physics of quantized vortices. First, vortices in a rotating BEC can be imaged optically. Optical imaging provides a simple, but quite powerful, diagnostic, which is essential for many experiments. Secondly, BEC is a “super clean” system which is free from pinning. This has enabled observation of Tkachenko modes, the long-predicted long-wavelength excitations of the vortex lattice. Finally, this well-controlled and easily-manipulated system can also provide another route for better understanding of vortex physics of the more complicated systems, like high-temperature superconductors. Here we report on the techniques we use for nucleation of vortices and on several experiments that have been implemented in our lab during the past couple of years.