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Mass of a quantized vortex[1] DAVID THOULESS, Univ. of Washington, JAMES ANGLIN, Univ. of Kaiserslautern — There have been many discussions of the mass of quantized vortices in superfluids, but different conclusions have been reached. There is a consensus that vortex mass diverges in compressible superfluids. We have studied the vortex mass in an incompressible quantum fluid by considering a vortex driven slowly round a circular orbit, treating frequency and speed as small parameters. The centrifugal force measures the vortex mass. If a vortex is driven by a large-radius repulsive potential its mass is close to the mass of fluid displaced, as in classical hydrodynamics, but for small pinning radius the mass diverges as the logarithm of the pinning radius. It can be argued that this logarithmic dependence on the pinning radius is a general feature of models of quantized vortices.

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