The Generation of Turbulence Within Shaken Bose-Einstein Condensates

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Following recent experimental studies, we model the generation of three-dimensional quantum turbulence by shaking harmonically trapped atomic Bose-Einstein condensates. We compare the experimentally observable quantities (*e.g.* two-dimensional density images and density spectra) with the quantities which are either measured in related experiments with superfluid helium or are relevant in turbulence theory. We conclude that the quantum turbulence generated, a mixture of strong fragmented density fluctuations and small vortex loops, is unlike any other forms of quantum turbulence which has been theoretically investigated, thus posing a new challenge to the theoretical understanding of quantum turbulence.