MAR16-2015-000891

Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

Numerical simulation of quantum turbulence

MAKOTO TSUBOTA, Osaka City University

Turbulence in quantum fluids has been studied for more than half century, and the recent developments of visualization experiments are so remarkable that they have made significant contributions for understanding the topics. Numerical simulation is also indispensable for this field. Two kinds of formulation are generally available. One is the vortex filament model useful for simulation of dynamics of quantized vortices in superfluid helium. The other is the Gross-Pitaevskii model that addresses the order parameters in Bose-Einstein condensation and is applicable for atomic condensates. We discuss some novel important topics of both simulations. One is inhomogeneous turbulence in superfluid helium, which was recently revealed by the visualization experiments. Another is quantum turbulence in atomic Bose condensates addressing multi-component order parameters.