Dynamics of the Cluster of Vortex Points in Two-Dimensional Superfluid ^{4}He

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We have simulated the dynamics of cluster of quantized vortex points with the same circulation in two-dimensional superfluid ^{4}He. In two-dimensional quantum turbulence, vortices are always distributed uniformly, but often form some clusters[1]. We study the dynamics of a cluster at zero temperature and finite temperatures. At zero temperature, the cluster only rotates. On the other hand, at finite temperatures, the vortices form a vortex lattice and diffuse with reducing the energy because of mutual friction which works as the repulsive interaction between the same circulation vortices. We investigate for the structure function for the vortex lattice formation.

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