Decay of time correlations in point vortex systems

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In this study, we explore the temporal structure of equilibrium dynamics of a well-known classical particle model in 2D fluid mechanics, a large point vortex system. The initial configuration consists of vortices that are uniformly distributed on a torus, and with independent positions; we consider the case in which the point vortices have intensities $\gamma = \pm 1$, half of each sign, so that observables are zero averaged on the torus.

Through numerical investigations, we show that there is evidence of persistence in time correlation of local observables of the vortex configuration, characterized by a power law decay of $1/t$. We discuss the implications of these findings on the ergodicity and mixing properties of equilibrium dynamics in point vortex models.
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