

Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Self-similar motions of point vortices and related relative equilibrium states TAKESHI GOTODA, Nagoya Univ — We talk about self-similar motions of point vortices, which are governed by the point-vortex (PV) system. The explicit formula for self-similar solutions of the PV system has been established for the three PV problem and specific examples of the four and five PV problems. We see that the families consisting of these self-similar solutions are expressed by one-parameter families, and their collapse time and Hamiltonian are functions of the same parameter. Then, the configurations at limits of the parameter are in relative equilibria. As for the N -vortex problem, we consider the case that $N - 1$ point vortices have a uniform vortex strength with the help of numerical computations. We show that families of self-similar collapsing solutions continuously depend on the Hamiltonian and relative equilibria appear in their limit states. In particular, we can prove the existence of relative equilibria for the four PV system. We also see some examples of four and seven point vortices with non-uniform vortex strengths.

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Date submitted: 30 Jul 2020

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