

1135-76-3124 **Stefan G. Llewellyn Smith*** (sg1s@ucsd.edu), MAE, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0411. *Generalizing point vortices.*

Kirchhoff's equations of motion for point vortices are a paradigm of reduction of an infinite-dimensional dynamical system, namely the incompressible Euler equations, to a finite-dimensional system. Yet the original incompressible Euler equations neglect physical phenomena that may be important, for example compressibility, density differences and other wave fields such as those caused by background vorticity gradients. In addition, one can also examine other generalizations of the point vortex singularity, such as higher singularities or the effect of different desingularizations of the point vortex system. The history of point vortices and a number of these extensions, in particular hollow vortices and Sadovskii vortices, are discussed. Some related mathematical problems are mentioned. (Received September 26, 2017)