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Conservative schemes for dynamical systems with application to vortex dynamics

We present a new class of conservative method, called the multiplier method, which enables systematic construction of conservative schemes for general dynamical systems. Specifically, the multiplier method can preserve arbitrary forms of conserved quantities and is applicable for systems without a symplectic or variational structure, such as dissipative problems. We illustrate this method for the point vortex problem on the plane and the sphere, and if time permits, for vortex blobs dynamics.