**Dynamics of Smooth Elliptical Vortices Computed by a Vortex Method** ROBERT KRASNY, University of Michigan, LING XU, North Carolina Agricultural and Technical State University — A new version of the vortex method is presented for vortex dynamics in 2D ideal fluid flow. The scheme uses Lagrangian particles and panels, Biot-Savart kernel smoothing, remeshing, adaptive mesh refinement, and treecode acceleration. The method is applied to compute the dynamics of elliptical vortices; two cases are considered, one with a smoothed Kirchhoff profile and one with a Gaussian profile. In both cases the rotating core sheds spiral filaments that radiate outward, however the Kirchhoff vortex forms a tripole structure, while the Gaussian vortex becomes axisymmetric on a faster time scale. In addition, the vorticity distribution in the Gaussian vortex has small amplitude bands in the core.

Robert Krasny
University of Michigan

Date submitted: 29 Jul 2020

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