Axisymmetrization and Tripole Formation in an Elliptic Vortex

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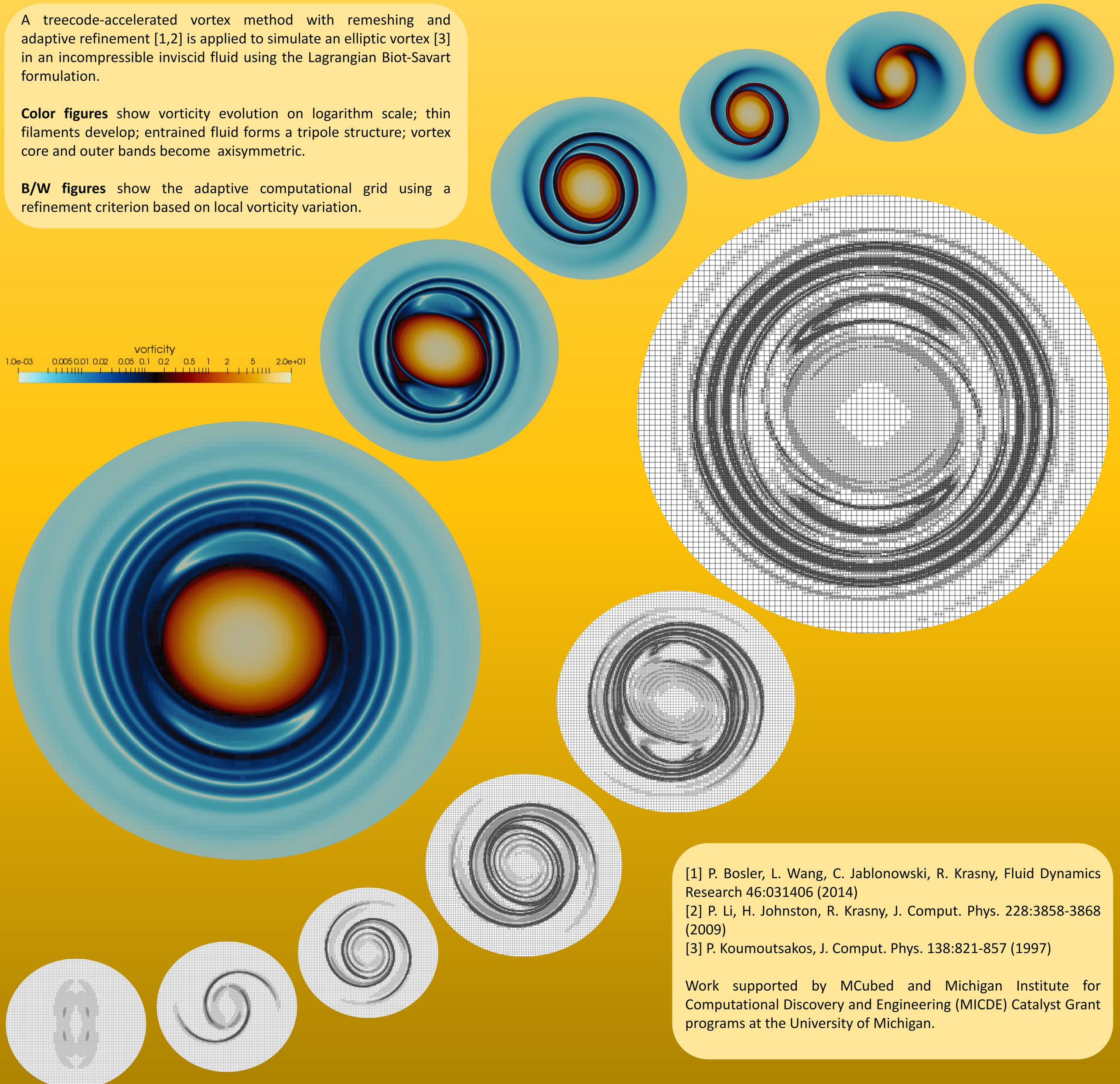
A treecode-accelerated vortex method with remeshing and adaptive refinement [1,2] is applied to simulate an elliptic vortex [3] in an incompressible inviscid fluid using the Lagrangian Biot-Savart formulation.

Color figures show vorticity evolution on logarithm scale; thin filaments develop; entrained fluid forms a tripole structure; vortex core and outer bands become axisymmetric.

B/W figures show the adaptive computational grid using a refinement criterion based on local vorticity variation.



[1] P. Bosler, L. Wang, C. Jablonowski, R. Krasny, Fluid Dynamics Research 46:031406 (2014)
[2] P. Li, H. Johnston, R. Krasny, J. Comput. Phys. 228:3858-3868 (2009)
[3] P. Koumoutsakos, J. Comput. Phys. 138:821-857 (1997)

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