

Abstract Submitted
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Sadovskii vortex in strain¹ DANIEL FREILICH, STEFAN LLEWELLYN SMITH, University of California, San Diego — A Sadovskii vortex is a patch of fluid with uniform vorticity surrounded by a vortex sheet. Using a boundary element type method, we investigate the steady states of this flow in an incompressible, inviscid straining flow. Outside the vortex, the fluid is irrotational. In the limiting case where the entire circulation is due to the vortex patch, this is a patch vortex (Moore & Saffman, *Aircraft wake turbulence and its detection* 1971). In the other limiting case, where all the circulation is due to the vortex sheet, this is a hollow vortex (Llewellyn Smith and Crowdy, *J. Fluid Mech.* **691** 2012). This flow has two governing nondimensional parameters, relating the strengths of the straining field, vortex sheet, and patch vorticity. We study the relationship between these two parameters, and examine the shape of the resulting vortices. We also work towards a bifurcation diagram of the steady states of the Sadovskii vortex in an attempt to understand the connection between vortex sheet and vortex patch desingularizations of the point vortex.

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