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Sadovskii vortex in strain DANIEL FREILICH, STEFAN LLEWELLYN SMITH, University of California, San Diego — Sadovskii vortices are patches of fluid with uniform vorticity surrounded by a vortex sheet. They were first constructed as models for wakes behind bluff objects. We investigate the Sadovskii vortex in a straining field and examine limiting cases to validate our computational method. One limit is the patch vortex in strain (Moore & Saffman, *Aircraft wake turbulence and its detection* 1971), where there is no vortex sheet. We solve this as a free-boundary problem, and show that a simple method using the Biot-Savart law quickly gives solutions for stable shapes. When used for the more elongated (stronger straining field) situations, the method also leads to new vortex shapes. In the hollow vortex case, where there is no vortex patch and the circulation is entirely due to the vortex sheet (Llewellyn Smith and Crowdy, *J. Fluid Mech.* **691** 2012), we use the Birkhoff-Rott equation to calculate the velocity of the fluid on the vortex boundary. The combination of these two methods can then be used to calculate the shape and velocity field of the Sadovksii vortex in strain.

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