On the rotating patches for inviscid flows

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In this talk we discuss some results on the rotating patches for the incompressible Euler equations. In the simply connected domains, it is known that the ellipses rotate uniformly around their center of mass. These geometries are a special case of the V-states discovered by Deem-Zabusky and Burbea and bifurcating from the Rankine vortex. We prove that the V-states have C^∞ boundary close to the circle in the Lipschitz norm. We also present some results in the case of the doubly connected domains and we give a complete description when one of the interfaces is an ellipse.