Abstract Submitted
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Vortex shedding and Maxwell's problem SEBASTIEN MICHELIN, STEFAN LLEWELLYN SMITH, MAE, UCSD — The coupled problem of a flow around a solid body has applications from the fall of objects in a fluid to the computation of forces on wind-exposed structures. A simplified 2D model is proposed here for the interaction between solid bodies and potential flows. Potential flows over sharp edges generate singular velocities at the edges. To satisfy the Kutta condition, vorticity sheets must be shed from the edges to remove these singularities. Here 2D vorticity sheets are represented as discrete point-vortices with monotically varying intensity. From the fluid momentum conservation, an equation of motion for these vortices, the Brown and Michael equation, is derived and mechanical efforts applied by the fluid on the body are computed. The set of dynamical equations obtained for the fluid-body system is closed and is applied to Maxwell's problem of the 2D fall of a plate in an inviscid fluid initially at rest.

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