

Abstract Submitted
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Angular momentum in vortex sheets ADAM DEVORIA, KAMRAN MOHSENI, University of Florida — The conservation of angular momentum in vortex sheets is considered. When the integrity of the vortex sheet as a mathematically continuous object is maintained, the angular momentum is automatically conserved by virtue of linear momentum conservation. However, the practical computation of the dynamics of a complete vortex sheet is a numerically intractable problem. The common method of replacing the inner spiral core of a rolled-up sheet by an isolated point vortex requires the conservation of circulation and linear momentum. However, since a finite portion of the fluid domain occupied by the sheet has been removed and replaced by a single point, the angular momentum of that finite portion must be explicitly considered and conserved. The time rate-of-change of angular momentum in the core is represented by a moment/torque on the vortex and the corresponding conservation is ensured by the appropriate vorticity flux into the core and throughout the sheet. The effect of this constraint on the total circulation in the sheet and the location of the vortex are presented for the roll-up of self-similar vortex sheets.

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