

Abstract Submitted
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Instability of a vortex sheet leaving a right-angled wedge STEFAN LLEWELLYN SMITH, ANTHONY DAVIS, Univ of California - San Diego — We examine the dynamics of a semi-infinite vortex sheet attached not to a semi-infinite plate but instead to a rigid right-angled wedge, with the sheet aligned along one of its edges. The resulting linearised unsteady potential flow is forced by an oscillatory dipole in the uniform stream passing along the top of the wedge, while there is stagnant fluid in the remaining quadrant. The essentially quadrant-type geometry replaces the usual Wiener–Hopf technique by the Mellin transform. The core difficulty is that a first-order difference equation of period 4 requires a solution of period unity. As a result the complex fourth roots $(\pm 1 \pm i)$ of -4 appear in the complementary function. The Helmholtz instability wave is excited and requires careful handling to obtain explicit results for the amplitude of the instability wave.

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