

Abstract Submitted
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A

revision to the hydrodynamic instability theory of Chandrasekhar¹ R. PAUL DRAKE, University of Michigan — To address waves and instabilities in systems having volumetric vorticity, one cannot use potential flow theory and must instead work from the Euler equations (for inviscid flows). The standard model, provided for example in the relevant book by Chandrasekhar, has disturbing features, one of which is that the pressure may not be continuous across an interface. This conflicts with our basic conceptual understanding of fluids and also with derivations using potential flow. Resolving the troubling issues requires that one take a different approach to the instability derivation. One way to do so will be described herein. The revised derivation reproduces the standard results for simple Kelvin Helmholtz and Rayleigh Taylor instabilities, but obtains very different results for the case of an extended shear layer.

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