

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

On Existence of Relative Equilibria of Two-Dimensional Vortex Sheets¹ BARTOSZ PROTAS, McMaster University, MARCEL RODNEY, McGill University — In this study we consider the existence of relative equilibria of two-dimensional vortex sheets. We focus on open sheets and derive conditions which must be satisfied by equilibrium configurations of such sheets. It is shown that, in contrast to the time-dependent case, such sheets must be everywhere orthogonal to the velocity field of the coordinate system in which they are stationary. Finally, we provide a rigorous demonstration that for vortex sheets arising from desingularization of translating (counter-rotating) and corotaing pairs of point vortices such equilibrium configuration do not in fact exist. The argument is based on classical results concerning existence of solutions of singular integral equations.

¹Supported by NSERC (Canada) Discovery and USRA Programs.

Bartosz Protas
McMaster University

Date submitted: 04 Aug 2011

Electronic form version 1.4