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Front pinning in single vortex flows JOHN MAHONEY[1], KEVIN MITCHELL, Univ of California - Merced — We study fronts propagating in 2D fluid flows and show that there exist stable invariant front configurations for fairly generic flows. Here we examine the simple flow which combines a single vortex with an overall "wind." We discuss how the invariant front can be derived from a simple 3D ODE. Existence of this front can then be understood in terms of bifurcations of fixed points, and the behavior of the invariant "sliding front" submanifold. Interestingly, the front bifurcation precedes the saddle-node bifurcation which gives rise to the vortex. This elementary structure has application in chemical reactor beds and laminar combustion in well-mixed fluids.

[1]We request that this talk follow the related talks by our collaborators Tom Solomon, Savannah Gowen, and Sarah Holler.

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