Abstract Submitted
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Burning manifolds and burning lobes[1] MARK KINGSBURY, TOM SOLOMON, Bucknell University — We present experimental studies of the propagation of a reaction front in a fluid flow composed of a chain of alternating vortices. We propose that the tools used to describe the transport of a *passive* impurity in a flow can be expanded to account for the behavior of a reaction front. In particular, we propose that motion of a reaction front from one region to another in the flow is determined by *burning manifolds* and *burning lobes*. These ideas are tested experimentally for both the time-independent and time-dependent vortex chain. For a time-independent flow, the time that it takes for a triggered reaction to propagate from one vortex to the next is the minimum time τ for the stable burning manifold $B_S(\tau)$ to envelope the original trigger point. For a time-dependent (oscillatory) vortex chain, we use the burning manifold/lobe framework to explain mode-locking behavior seen in earlier studies.[2]

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[2]M.S. Paoletti and T.H. Solomon, Europhys. Lett. **69**, 819 (2005); Phys. Rev. E **72**, 046204 (2005).

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