Abstract Submitted
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Experimental studies of stationary reaction fronts in a chain of vortices[1] CARLEEN BOYER, Bucknell University, TOM SOLOMON, Bucknell University — We present results of experiments studying the behavior of the excitable Belousov-Zhabotinsky (BZ) reaction in a chain of alternating vortices with an imposed uniform wind. Previous experiments[2] have shown that fronts in this system are pinned for a wide range of imposed wind speeds, propagating neither forward against the wind nor in the downwind direction. We explain this behavior with a recent theory[3] that proposes the existence of *burning invariant manifolds* (BIMs) that act as local barriers to front propagation. Fronts are pinned when a BIM or a combination of BIMs spans the width of the vortex chain, blocking the reaction front. We show experimental measurements of the shape of the pinned front for a range of different wind speeds, and compare these shapes to the BIMs calculated theoretically. We also consider the dependence of the front shape on the location of the initial trigger for the front.

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[2]M.E. Schwartz and T.H. Solomon, Phys. Rev. Lett. **100**, 028302 (2008).
[3]J. Mahoney, D. Bargteil, M. Kingsbury, K. Mitchell and T. Solomon, Europhys. Lett. **98**, 44005 (2012).

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