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Dynamics of fluid driven fracturing of magnetic elastica JEROME NEUFELD, BP Institute, Department of Earth Sciences, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, THOMAS LE REUN, École Normale Supérieure de Lyon — The dynamic spreading of viscous fluids between magnetic elastic sheets provides an novel experimental system in which to examine the interplay between bending, in-plane tension, and a form of "magnetic" fracturing. A suite of constant volume, and fixed flux injections of viscous fluid demonstrate the quasi-static and dynamic responses of the magnetic, elastic sheets. For fixed fluid volume, magnetic adhesion leads to static solutions in both the tensional (thin membrane) and bending (thick membrane) limits, directly analogous to to the sessile capillary drop. These static tensional and bending solutions are also observed when the fluid injection flux is small. For larger fluid fluxes, new dynamic solutions emerge as reflected in the rates of deformation and spreading. This new experimental system provides a laboratory in which to repeatably study the dynamics of fluid driven fracturing of elastica.

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