

Abstract Submitted
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Capillary instabilities of non-axisymmetric stripe arrays atop a viscous medium¹ ZHENG ZHANG, YIFU DING, Univ of Colorado - Boulder — We study the simultaneous capillary breakup of parallel polymer stripes, which were non-axisymmetrically embedded in another immiscible polymer medium. Polystyrene (PS) and poly(methyl methacrylate) (PMMA) were used because of both their immiscibility and well-characterized properties. The influences of the stripe-to-matrix viscosity ratio, volume ratio and substrate energy on the morphological development were examined. Notably, phase-correlation in the breakup of neighboring stripes was observed. The transition between in-phase and out-of-phase breakup was controllable with the degree of substrate confinement. Under strong substrate confinement, the simultaneous breakup of the parallel polymer stripes transitioned from non-correlated to in-phase, irrespective of the viscosity ratio between PS and PMMA.

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