

Abstract Submitted
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Electric Field-Induced Dewetting and Structure Formation in Thin Polymer-Polymer-Air Trilayers K. AMANDA LEACH, SURESH GUPTA, THOMAS P. RUSSELL, Polymer Science and Engineering Department, University of Mass.- Amherst, 01003., MICHAEL D. DICKEY, C. GRANT WILLSON, Department of Chemical Engineering, University of Texas at Austin, 78712. — The size scale of electrohydrodynamic instabilities in thin polymer films can be controlled by manipulating electrostatic pressure and surface tension. It has been shown that electric field-induced fluctuations can also drive polymer-polymer dewetting in trilayers and that concentric structures can be formed, in which the lower polymer layer surrounds the structures in the upper polymer film. We show that an array of encapsulated or ribbed cage-type structures can be formed when the height of the structures is increased. Alternatively, when the upper polymer layer preferentially wets the substrate, the lower layer is encapsulated. These methodologies have the capability to produce arrays of structures, with controlled size scale and spacing, that cannot otherwise be produced.

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