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Two-Dimensional Instabilities in Patterned Diblock Copolymer Films JOSEPH PARETE, Department of Engineering Physics and the Brockhouse Institute for Materials Research, McMaster University, ANDREW B. CROLL, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, JOHN S. PRESTON, Department of Engineering Physics and the Brockhouse Institute for Materials Research, McMaster University, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University — We have developed a novel surface tension-driven laser lithography technique that enables the effective generation of microstructures in polymer systems. Combining this approach with naturally occurring instabilities in symmetric diblock copolymer films allows us to produce structures far smaller then those imposed by the resolution of the laser patterning procedure. An example of this is the Plateau-Rayleigh instability, which results in the breaking up of an extended cylinder into an arrangement of smaller, evenly spaced droplets. Since our diblock system can be considered an ideal two-dimensional system, the creation of various structures using laser lithography provides an excellent probe for studying instabilities in two dimensions. Optical and atomic force microscope measurements are presented and discussed in terms of a linear stability analysis.

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