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**Two distinct timescales in the ordering of symmetric diblock copolymer films** ROBERT D. PETERS, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON, Canada, L8S 4M1 — At equilibrium, an ordered symmetric diblock copolymer film forms lamellae parallel to the substrate interface. Furthermore, unless a film's thickness is exactly commensurate with the intrinsic height of the layered structure, the free surface will break up into holes or islands with a thickness corresponding to one lamellae. This ensures that the preferred lamellar spacing of the film is achieved while volume is conserved. We study the internal dynamics of ordering as a lamellar forming thin film transitions from the disordered state to its equilibrium morphology. In particular, before the free surface nucleates to form islands or holes, a film must begin by ordering internally. Using ellipsometry, we measure small changes in the internal film structure as the diblock orders prior to any change of the free surface topology. We probe two distinct timescales along the pathway to an equilibrium state: 1) An initial ordering time where molecules begin to align and form lamellae; and 2) an incubation time where the structure remains constant before nucleation of holes or islands. We will show the effect that film height and commensurability has on these two timescales, allowing us to better understand the effect of confinement on the ordering dynamics of lamellar forming thin films.

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