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Layer Thinning in Freely-Suspended Thin Liquid Films of a Symmetric Liquid Crystal Dimer SHOKIR PARDAEV, ZEINAB PARSOUZI, JAMES GLEESON, Department of Physics,Kent State Univ - Kent, ANTAL JAKLI, Chemical Physics Interdisciplinary Program and Liquid Crystal Institute, Kent State Univ-Kent, SAMUEL SPRUNT, Department of Physics,Kent State Univ - Kent — We report optical reflectivity and dynamic light scattering (DLS) studies on freely suspended smectic films of a symmetric liquid crystal dimer, which exhibits the phase sequence isotropic—nematic—twist-bend nematic—smectic in cooling. In sufficiently thin films the reflectivity R is expected to scale as the square of the number of smectic layers (N^2) while the frequency f of underdamped layer fluctuations scales as $N^{-1/2}$. On heating thin films drawn in the smectic phase, we observe a sequence of layer thinning transitions, with R and f following the expected scaling relations, provided the stepwise melting involves double rather than single layers. We will describe a model to explain the unusual layer thinning process.\pardWe thank M. G. Tamba and G. Mehl for providing the liquid crystal compound: NSF grant DMR-1307674.

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