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Stable Algorithms for Modeling Thin-Film Epitaxial Growth¹ GREG SEYFARTH, Colby College, BENJAMIN VOLLMAYR-LEE, Bucknell University — We search for stable time-stepping schemes for a phase-field model of thin film epitaxial growth. In particular, we consider a class of linear semi-implicit schemes which ensure the free energy decreases with time, a property called gradient stability. System dynamics slow at late times, so gradient stable schemes which allow adaptive time stepping are highly desirable. We perform a linear stability analysis and support it with numerical testing, revealing a region in parameter space of gradient stable semi-implicit schemes.

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