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([morini@sissa.it](mailto:morini@sissa.it)), S.I.S.S.A./ I.S.A.S., Via Beirut 2-4, 34013 Trieste, Italy. *A model for the epitaxial growth of an elastic thin film on a lattice-mismatched substrate.* Preliminary report.

Strained epitaxial film grown on a relatively thick substrate is considered in the context of linear elasticity. The film and substrate are modeled as isotropic elastic solids with similar material properties and the geometry is assumed to be two-dimensional. The total free energy of the system consists of the energy of the free surface of the film and the strain energy. Because of the lattice mismatch between film and substrate, flat configurations are in general energetically unfavourable and a corrugated or islanded morphology is the preferred growth mode of the strained film. After specifying the mathematical setup of the problem, qualitative and regularity properties of the solutions (i.e. local minimizers of the total free energy) are studied. (Received August 28, 2005)