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Variational models for prestrained plates with
the Monge-Ampère constraint

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I will discuss the derivation (through Gamma-convergence) and properties of a model energy in the description of thin films exhibiting residual stress at free equilibria. This energy consists of a simple bending content, but restricted to the displacements satisfying the constraint $\det \nabla^2 v = g$.

I will further discuss some necessary tools in the analysis of the above model, towards understanding the more complicated fully nonlinear prestrained bending model. In this context, I will present a theorem on approximating $W^{2,2}$ solutions of the Monge-Ampère equation by smooth solutions, a result on the continuation of the infinitesimal isometries, and some observations on multiplicity of solutions to the prestrained variational model.

This talk is based on joint work with R. Pakzad, L. Mahadevan, and P. Ochoa.