Meeting: 1004, Bowling Green, Kentucky, SS 13A, Special Session on Nonlinear Analysis and Applied Mathematics

1004-35-201 **Felix Otto**, **Tobias Rump** and **Dejan Slepcev*** (slepcev@math.ucla.edu), Mathematics Department, UCLA, Los Angeles, CA 90095-1555. *Coarsening in a thin-film equation: A rigorous upper bound on coarsening rate.* Preliminary report.

Nearly uniform thin film of viscous liquid can destabilize under the effects of intermolecular forces. The film almost ruptures, "dry" regions form and the film breaks up into ridges and eventually droplets surrounded by an ultra-thin liquid film. This structure coarsens on a slow time-scale: The number of droplets is decreasing, while their average mass is increasing.

We will discuss coarsening of solutions of a thin-film equation that is a gradient flow in Wasserstein metric. In the context of the Kohn-Otto framework, we obtain a rigorous upper bound on coarsening rate. The obtained upper bound is in agreement with heuristic arguments for the actual coarsening rate given by Glasner and Witelski who studied coarsening in the context of lubrication approximation of one dimensional liquid films. (Received January 24, 2005)