

Abstract Submitted  
for the DFD10 Meeting of  
The American Physical Society

**Evaporation of thin liquid films into air** VLADIMIR AJAEV, Southern Methodist University, DAVID BRUTIN, LOUNES TADRIST, Polytech Marseille (France) — We develop a mathematical model of evaporation of a thin liquid film into air under the action of disjoining pressure. The rate of evaporation is determined from the numerical solution of a coupled system of equations describing heat conduction in the liquid and diffusion of vapor through air. Local vapor concentration near the film surface is assumed equal to its equilibrium value at the local temperature. Evolution of the film is studied for two commonly used disjoining pressure models. Conditions are formulated at which disjoining pressure suppresses evaporation. The model is applied to investigation of the effect of evaporation on contact lines on heated surfaces.

Vladimir Ajaev  
Southern Methodist University

Date submitted: 05 Aug 2010

Electronic form version 1.4