Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Modeling of moving contact lines on electrically charged heated surfaces VLADIMIR AJAEV, Southern Methodist University — Local fluid flow and heat transfer near moving contact lines on heated surfaces is usually described by mathematical models incorporating the effects of evaporation, surface tension, thermocapillarity, and disjoining pressure due to London-van der Waals forces. However, this description is not accurate for the cases when electric charges in the liquid and on the heated surface are present, which is usually the case in applications involving water and liquid metals. We develop a model which incorporates the electrostatic effects into the standard lubrication-type model of a contact line on a heated surface. The gas phase above the liquid is assumed to be pure vapor and the macroscopically dry region of the solid is covered with an adsorbed film. The local liquid-vapor interface shapes and the apparent contact angle are described as functions of the temperature and the charge density at the solid surface.

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Date submitted: 05 Aug 2011 Electronic form version 1.4