

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Evaporating shear-driven liquid film ELIZAVETA GATAPOVA, Institute of Thermophysics SB RAS, OLEG KABOV, Institute of Thermophysics SB RAS, Universite Libre de Bruxelles — The study of an evaporating shear-driven liquid film with a localized heating is motivated by potential application in cooling of microelectronics on earth and in space. The work is also a part of the preparation of the ESA SAFIR experiment onboard the ISS. The modeling of evaporating thin liquid film driven by body force or shear stress is important both from a practical point of view and as task in investigation of film local dry-out resulting in formation of apparent contact lines. Two types of models for shear-driven liquid film with phase transitions have been developed. One of them is a two-sided model that is capable to evaluate the evaporation effect on heat transfer enhancement. Some quantitative and qualitative comparisons with experimental results are presented. The one-sided mathematical model is developed in the framework of the lubrication approximation describing the behavior of contact line. Evaporation, slip, disjoining pressure, capillarity and shear stresses effects are included in the model. The effect of the slip condition at the solid-liquid surface has been examined.

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Date submitted: 03 Aug 2008

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