Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Investigation of interfacial phenomena and thermocapillary effect on drop evaporation in reduced gravity condition JINGCHANG XIE, HAI LIN, Institute of Mechanics, CAS — Based on ground-based experiments, a drop evaporation experiment will fly aboard Chinese recoverable satellite in the near future This experiment will focus on the interfacial phenomena of phase chance, heat and mass transfer and the effect of thermocapillary convection on drop evaporation process Close attention will also be paid to the contact angle behavior, the triple line shifting and their relations Our ground-based experiments observed the interior flow field and the gaseous exterior of small suspended evaporating drops, the temperature distributions inside and outside the drops. Both good heat conductor and heat insulating material were used as substrate materials to investigate their influence on heat transfer and surface temperature distribution of an evaporating drop Experimental results indicate that for a drop evaporating in ambient temperature without substrate heating, temperature gradients existed along the drop surface which results in stable thermocapillary convection and cells appeared near the surface throughout entire evaporating process. The thermocapillary convection greatly changed drop's interior temperature distribution and the way of energy and mass transfer. Temperature jump or discontinuity was also measured at drop free surface.

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Date submitted: 16 Jul 2013 Electronic form version 1.4