

Abstract Submitted  
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**Gibbs Adsorption in Binary Liquid Mixtures: Concentration Variations Beyond Surface Monolayer in BiSn alloy**<sup>1</sup> REINHARD STREITEL, OLEG SHPYRKO, ALEXEI GRIGORIEV, PETER S. PERSHAN, Physics Department and DEAS, Harvard University, Cambridge, MA 02138, BEN OCKO, Brookhaven National Laboratory, Upton, NY 11973, MOSHE DEUTSCH, Bar-Ilan University, Ramat-Gan 52900, Israel — We report the observation of a surface-induced structure of  $Bi_{43}Sn_{57}$  eutectic alloy measured at  $147^\circ C$  (eutectic melting point  $141^\circ C$ ). X-ray reflectivity indicates the formation of surface layering structure extending to the top 3 surface layers. Application of resonant x-ray reflectivity measurements reveals enhancement of the lower-surface tension component in surface monolayer (92 at.% of Bi/8 at.% of Sn), in full agreement with Gibbs adsorption rule. However, we also observe a Bi depletion (24 at.% of Bi/76 at.% of Sn) in the second surface layer followed by a slight Bi enhancement (54 at.% of Bi/46 at.% of Sn) in the third surface layer. These results demonstrate the interplay of minimization of surface energy by reducing surface tension and the formation of an eutectic alloy at the surface. The propagation of a surface adsorption effect well beyond the surface monolayer will be discussed.

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