Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Film drainage of viscous liquids on top of bare bubble: Influence of the Bond number FLORENCE ROUYER, LPMDI-UPEMLV, HELENA KOČÁRKOVÁ, SALAHEDINE METALLAOUI, FRANCK PIGEONNEAU, SVI-SGR, LPMDI- UNIVERSITÉ PARIS-EST MARNE LA VALLÉE TEAM, SVI-SAINT-GOBAIN RECHERCHE TEAM — We present experimental result of film drainage on top of gas bubbles pushed by gravity forces toward the upper surface of a liquid bath for Newtonian liquids with mobile interface (UCON, castor oil and soda-lime-silica melt). The temporal evolution of the thickness of the film between a single bubble and the air/liquid interface is investigated *via* interference method under various physical conditions, range of viscosities and surface tension of the liquids, and bubble sizes. These experiments evidence the influence of the deformation of the thin film on the thinning rate and confirm the slow down of film drainage with Bond number as previously reported by numerical work. A simple model that considered the liquid flow in the cap squeezed by buoyancy forces of the bubble is in good agreement with experimental and numerical data. Qualitatively, the smaller is the area of the thin film compare to the surface of the bubble, the faster is the drainage.

Florence Rouyer
UPEMLV

Date submitted: 08 Aug 2011 Electronic form version 1.4