

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Tears of Wine** PRERANA RATHORE, VIVEK SHARMA, Chemical Engineering, University of Illinois at Chicago — ‘Tears of wine’ refer to the rows of wine-drops that spontaneously emerge within a glass of strong wine. Evaporation-driven Marangoni flows near the meniscus of water-alcohol mixtures drive liquid upward forming a thin liquid film, and a rim or ridge forms near the moving contact line. Eventually the rim undergoes an instability forming drops, that roll back into bulk reservoir forming so called tears or legs of wine. Most studies in literature argue the evaporation of more volatile, lower surface tension component (alcohol) results in a concentration-dependent surface tension gradient that drives the climbing flow within the thin film. Though it is well-known that evaporative cooling can create temperature gradients that could provide additional contribution to the climbing flows, the role of thermocapillary flows is less well-understood. Furthermore, the patterns, flows and instabilities that occur near the rim, and determine the size and periodicity of tears, are not well-studied. Using experiments and theory, we visualize and analyze the formation and growth of tears of wine. The sliding drops, released from the rim towards the bulk reservoir, show oscillations and a cascade of fascinating flows that are analyzed for the first time.

Vivek Sharma  
Chemical Engineering, University of Illinois at Chicago

Date submitted: 13 Nov 2016

Electronic form version 1.4