Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Triple line kinetics in solid-state dewetting

ASHWANI TRIPATHI, OLIVIER PIERRE-LOUIS, Univ Lyon I UA 442 CNRS — Solid-state dewetting has been studied in a large number of experimental systems, such as SOI (Si on amorphous SiO$_2$), or metal films on various substrates. Several theoretical approaches have been proposed in the past 10 years to understand this phenomena, ranging from Kinetic Monte Carlo to phase field, and continuum Mullins-like models. We present a continuum model which addresses the question of the limit of validity of the usual approximation of a constant contact angle at the triple line between the solid, the film, and the vacuum (or vapor). Our results suggest that the Young relation is subject to systematic deviations, which could be measured in experiments. In addition, the so-called mass shedding effect, which leads to the breakup of the film at a finite distance from the triple-line, can be accelerated by orders of magnitude due to wetting effects.

1Supported by LOTUS Grant 11-13AP20

Ashwani Tripathi
Univ Lyon I UA 442 CNRS

Date submitted: 04 Nov 2015

Electronic form version 1.4