

Abstract Submitted
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Octopus-shaped Instabilities of Evaporating Droplets NEBOJSA MURISIC, LOU KONDIC, New Jersey Institute of Technology, YEHIEL GOTKIS, KLA-Tencor Corporation, IGOR IVANOV, Blue29 — We report on curious phenomena recorded recently during spreading of evaporating isopropyl alcohol droplets on silicon wafer surfaces ¹. Novel “octopus”-shaped instabilities were noticed appearing close to the contact line. In addition to our desire to understand the instability, a motivation for this study is the fact that the region close to the contact line carries significant amounts of solid residue which can deteriorate electrical and other properties of the semiconductor devices. After presenting the experimental results, we discuss a lubrication-based mathematical model describing spreading of volatile drops. Through linear stability analysis and numerical simulations, we show that essential factors influencing occurrence of “octopus”-shaped instabilities include volatility of liquid, and thermal conductivity of both liquid and solid.

¹see http://m.njit.edu/~kondic/thin_films/octopi.html

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