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Title:	Time-resolved interference unveils nanoscale surface dynamics in evaporating sessile droplet
Authors:	Verma, Gopal (/jspui/browse?type=author&value=Verma%2C+Gopal) Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	Nanoscale Time-resolved interference Dynamics
Issue Date:	2014
Publisher:	American Institute of Physics
Citation:	Applied Physics Letters,104(24)
Abstract:	We report a simple optical technique to measure time-resolved nanoscale surface profile of an evaporating sessile fluid droplet. By analyzing the high contrast Newton-ring like dynamical fringes formed by interfering Fresnel reflections, we demonstrated $\lambda/100 \approx 5$ nm sensitivity in surface height (at 0.01-160 nm/s rate) of an evaporating water drop. The remarkably high sensitivity allowed us to precisely measure its transient surface dynamics during contact-line slips, weak perturbations on the evaporation due to external magnetic field and partial confinement of the drop. Further, we measured evaporation dynamics of a sessile water drop on soft deformable surface to demonstrate wide applicability of this technique.
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