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Title:	Vectorial detection of sub-microscale capillary curvature by laser beam profile
Authors:	Verma, Gopal (/jspui/browse?type=author&value=Verma%2C+Gopal) Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	non-invasive sub-microscale capillary curvature
Issue Date:	2015
Publisher:	American Institute of Physics Inc.
Citation:	Applied Physics Letters, 107 (16)
Abstract:	We demonstrate a simple and non-invasive optical technique to detect direction and magnitude of long-range, sub-microscale capillary curvature of fluid interfaces in various situations. By analyzing magnitude and direction of the distorted spatial profile of the laser beam, following its weak Fresnel's reflection from the air-water interface, ultra-low curvature of $0.1 \mu\text{m}^{-1}$ caused by dipped slides, glass tubes, and microscopic twisted silk fibers was measured up to six capillary lengths away from the object. The flexibility of this technique allows us to measure curvature of remotely placed fluid-fluid interfaces and interaction between capillary curves of multiple objects. The high sensitivity of our technique is demonstrated in measuring magnetic susceptibility of water and the full spatial profile of deformation under weak magnetic field. This technique might find applications in precision measurements in optofluidics and interface physics.
URI:	<a href="https://aip.scitation.org/doi/10.1063/1.4934215">https://aip.scitation.org/doi/10.1063/1.4934215</a> ( <a href="https://aip.scitation.org/doi/10.1063/1.4934215">https://aip.scitation.org/doi/10.1063/1.4934215</a> ) <a href="http://hdl.handle.net/123456789/2744">http://hdl.handle.net/123456789/2744</a> ( <a href="http://hdl.handle.net/123456789/2744">http://hdl.handle.net/123456789/2744</a> )
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