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**The Rayleigh-Plateau Instability on a Fiber Revisited - Influence of the Hydrodynamic Boundary Condition** SABRINA HAEFNER, Saarland University, Experimental Physics, 66123 Saarbruecken, Germany, OLIVER BAEUMCHEN, Max Planck Institute for Dynamics and Self-Organization, 37077 Goettingen, Germany, MICHAEL BENZAQUEN, THOMAS SALEZ, Laboratoire de Physico-Chimie Theorique, UMR CNRS Guliver 7083, ESPCI, Paris, France, ROBERT PETERS, McMaster University, Department of Physics and Astronomy, Hamilton L8S4M1, Canada, JOSHUA D. MCGRAW, Saarland University, Experimental Physics, 66123 Saarbruecken, Germany, ELIE RAPHAEL, Laboratoire de Physico-Chimie Theorique, UMR CNRS Guliver 7083, ESPCI, Paris, France, KARIN JACOBS, Saarland University, Experimental Physics, 66123 Saarbruecken, Germany, KARI DALNOKI-VERESS, McMaster University, Department of Physics and Astronomy, Hamilton L8S4M1, Canada — The Rayleigh-Plateau Instability (RPI) of a liquid column underlies a variety of hydrodynamic phenomena that can be observed in everyday life. In the classical case of a free liquid column, linear perturbation theory predicts characteristic rise-times and wavelengths. However, the description of a liquid layer on a fiber requires the consideration of the solid/liquid interface in addition to the free interface. In this study, we revisit the RPI of a viscous liquid layer on a solid fiber by varying the hydrodynamic boundary condition at the fiber/liquid interface. The rise of the amplitudes of the surface undulations is precisely tracked and the growth rate of the instability is determined for the different slip boundary conditions and compared to the theoretical models.

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