APS Note: Changed to poster.

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Influence of Slip on the Rayleigh-Plateau Rim Instability in Dewetting Polymer Films OLIVER BAEUMCHEN, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, ON, Canada, L8S 4M1, KARIN JACOBS, LUDOVIC MARQUANT, SABRINA HAEFNER, MISCHA KLOS, Saarland University, Department of Experimental Physics, 66123 Saarbruecken, Germany, RALF BLOSSEY, Interdisciplinary Research Institute (IRI), CNRS USR 3078, Villeneuve d'Ascq, France, ANDREAS MUENCH, Mathematical Institute, University of Oxford, Oxford OX1 3LB, UK, BARBARA WAGNER, Technical University of Berlin, Institute for Mathematics, 10623 Berlin, Germany — A dewetting polymer film develops a characteristic fluid rim at its receding edge due to mass conservation. In the course of the dewetting process the rim becomes unstable via an instability of Rayleigh-Plateau type. An important difference exists between this classic instability of a liquid column and the rim instability in the thin film as the growth of the rim is continuously fueled by the receding film. We explain how the development and macroscopic morphology of the rim instability are controlled by the slip of the film on the substrate. A single thin-film model, valid for all slip lengths, captures quantitatively the characteristics of the evolution of the rim observed in our experiments.

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