Abstract Submitted
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Dewetting of Thin Polymer Films: The Role of Nonlinear Friction[1] THOMAS VILMIN, ELIE RAPHAËL, Laboratoire de Physique des Fluides Organisés, FRE 2844 du CNRS, Collège de France, 11 Place Marcelin Berthelot, 75231 Paris Cedex 05, France — The study of the dewetting of very thin polymer films has recently revealed many unexpected features (*e.g.* unusual rim morphologies and front velocities) which have been the focus of several theoretical models. Surprisingly, the most striking feature of all, that is a decrease of the rim width with time, have not yet been explained. In the present letter, we show how the combined effects of a non-linear friction between the film and the substrate, and the presence of residual stresses within the film, result in the presence of a maximum in the time evolution of the rim width. In addition, we show how the introduction of a non-linear friction can also simply explain the rapid decrease of the dewetting velocity with time observed experimentally.

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