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Instabilities and the intersonic nature of fracture in thin latex sheets PAUL PETERSAN, Center for Nonlinear Dynamics, Dept. of Physics, Univ. of Texas at Austin, ROBERT DEEGAN, Dept. of Mathematics, University of Bristol, MICHAEL MARDER, HARRY SWINNEY, Center for Nonlinear Dynamics, Dept. of Physics, Univ. of Texas at Austin — The instability of crack running in a popped balloon provides a novel test bed to study fundamental questions in fracture mechanics like crack path and velocity selection. Cracks in stretched latex sheets exhibit a transition from straight to oscillating paths as the amount of biaxiallity in the sheet is increased. It has also been recently observed that the cracks run at intersonic speeds, between the longitudinal and shear wave speeds, in the stretched material. These experiments studying the path and velocity of a fast running crack in biaxial stretched thin latex sheets will be described, as will recent and promising analytical and numerical investigations of fracture in highly extensible materials.

Paul Petersan
Center for Nonlinear Dynamics, Dept. of Physics, Univ. of Texas at Austin

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