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On the bouncing of rigid spheres on thin polymer films LAURENT COURBIN, ANTONIN MARCHAND, ASHKAN VAZIRI, HOWARD A. STONE, Division of Engineering and Applied Sciences, Harvard University — We report on a study of the rebound of stainless steel spheres on thin polymer films. After the sphere is dropped it bounces off the plastic sheet and the evolution in time of the subsequent rebounds are recorded. Experiments are performed varying the sphere radius, the impact velocity, and the film tension. The variations of the contact time, the amplitude of deformation of the film, and the loss of energy of the sphere after impact, as reported via a coefficient of restitution, lead to a number of scaling relations. These results are interpreted in terms of linear and nonlinear theories of the elasticity of membranes.

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