

Abstract Submitted
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Rubber Band Recoil ROMAIN VERMOREL, NICOLAS VANDENBERGHE, EMMANUEL VILLERMAUX¹, IRPHE, Aix - Marseille Universite —
When an initially stretched rubber band is suddenly released at one end, an axial stress front propagating at the celerity of sound separates a free and a stretched domain of the elastic material. As soon as it reaches the clamped end, the front rebounds and a compression front propagates backward. When the length of the compressed area exceeds Euler critical length, a dynamic buckling instability develops. The rebound is analysed using Saint-Venant's theory of impacts and we use a dynamical extension of the Euler-Bernoulli beam equation to obtain a relation between the buckled wavelength, the initial stretching and the rubber band thickness.

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