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Rubber band recoil in fluids ROMAIN VERMOREL, NICOLAS VANDENBERGHE, EMMANUEL VILLERMAUX, Irphe, Marseille, France — The recoil of a stretched rubber band is a familiar phenomenon which does not last for more than a millisecond. When an initially stretched rubber band is released at one end, a front leaving behind it stress-free elastic material propagates towards the clamped end. Its rebound results in a compression front propagating backwards, which triggers an elastic instability referred to as dynamic buckling. High speed movies reveal that the fluid environment affects both the propagation of axial stress waves along the elastic band and the buckling development itself. Our analysis quantifies the impact of a fluid environment on both the rubber motion and on the buckling wavelength selection, in agreement with the experimental findings.

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