Abstract Submitted
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Sequential buckling of an elastic wall[1] JOSE BICO, HADRIEN BENSE, LUDOVIC KEISER, BENOIT ROMAN, PMMH, ESPCI, Paris, France, FRANCISCO MELO, Universidad de Santiago de Chile, MANOUK ABKARIAN, Centre de Biochimie Structurale, Montpellier, France — A beam under quasistatic compression classically buckles beyond a critical threshold. In the case of a free beam, the lowest buckling mode is selected. We investigate the case of a long wall grounded of a compliant base and compressed in the axial compression. In the case of a wall of slender rectangular cross section, the selected buckling mode adopts a nearly fixed wavelength proportional to the height of the wall. Higher compressive loads only increase the amplitude of the buckle. However if the cross section has a sharp shape (such as an Eiffel tower profile), we observe successive buckling modes of increasing wavelength. We interpret this unusual evolution in terms of scaling arguments. At small scales, this variable periodicity might be used to develop tunable optical devices.

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