

Abstract Submitted  
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**Anomalous persistence of a pinch in a pipe** L. MAHADEVAN, A. VAZIRI, M. DAS, Harvard University — The response of low-dimensional solid objects combines geometry and physics in unusual ways, exemplified in structures of great utility such as a tubular shell that is ubiquitous in nature and technology. Here we provide a particularly surprising consequence of this confluence of geometry and physics in tubular structures: the anomalously large persistence of a localized pinch in an elastic pipe whose effect decays very slowly as an oscillatory exponential with a persistence length that scales as  $R^{3/2}/t^{1/2}$ , diverging as the thickness of the tube vanishes. The result is more a consequence of geometry than material properties, and is thus equally applicable to carbon nanotubes and cytoskeletal microtubules as it is to aircraft fuselages and geological plates, with a number of consequences, some of which we consider.

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