



## Pick-up and impact of flexible objects

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We consider a propagating contact discontinuity between flexible and rigid bodies, as may occur in everyday activities, or in the interactions between a mooring cable and the ocean floor, or between a string and a bridge in certain musical instruments. We examine the jumps in momentum and energy at such a discontinuity, and relate them by a simple invariance argument. For an inextensible string interacting with a smooth, flat surface in the presence of gravity, we conclude that a surprising asymmetry exists between picking up and laying down, such that kinks in geometry and associated jumps in tension are not admissible during pick-up. This prediction is consistent with our own and others' limited experimental evidence.