

Abstract Submitted  
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**Parity horizons and chronology protection in shape dynamics**

GABRIEL HERCZEG, Univ of California - Davis — Shape dynamics is a classical theory of gravity closely related to the canonical formulation of general relativity but which possesses "relativity of size" rather than "relativity of time". I introduce the notion of a parity horizon, and show that many simple solutions of shape dynamics possess them. I show that the event horizons of the known asymptotically flat black hole solutions of shape dynamics are parity horizons and that this notion of parity implies that these horizons possess a corresponding CPT invariance. I present three new solutions of shape dynamics with parity horizons and find that not only event horizons become parity horizons in shape dynamics, but observer-dependent horizons and Cauchy horizons do as well. The fact that Cauchy horizons become (singular) parity horizons suggests a general chronology protection mechanism in shape dynamics that prevents the formation of closed time-like curves.

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