## Phenomenology 2015 Symposium



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## **Examining the Viability of Phantom Dark Energy**

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In the standard cosmological framework of the 0th-order FLRW metric, dark energy as a scalar field with an equation-of-state parameter w < -1implies negative kinetic energy and vacuum instability. However, the value of best fit from Planck and WMAP9 for present-day w is indeed less than -1. We find that it is not as obvious as one might think that phantom dark energy has negative kinetic energy categorically. Staying within the confines of observational constraints and general relativity, for which there is good experimental validation, we consider a few reasonable departures from the standard cosmological framework in an attempt to see if negative kinetic energy can be avoided in these settings despite an apparent w < -1. We consider a more accurate description of the universe through the perturbing of the isotropic and homogeneous FLRW metric and the components of the stress-energy tensor, and we also consider dynamic w, and primordial isocurvature perturbations.

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