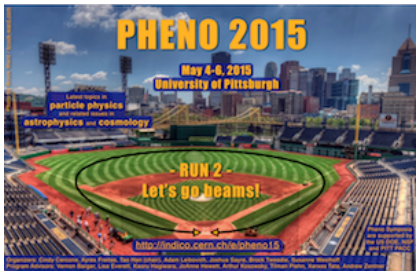

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Examining the Viability of Phantom Dark Energy

Monday 4 May 2015 15:15 (15 minutes)

In the standard cosmological framework of the 0th-order FLRW metric,
dark energy as a scalar field with an equation-of-state parameter $w < -1$
implies 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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