Abstract Submitted
for the APR13 Meeting of
The American Physical Society

**Mirage Models Confront the LHC: Kähler-Stabilized Heterotic String Theory** BRYAN KAUFMAN, BRENT NELSON, Northeastern University — We begin the study of a class of string-motivated effective supergravity theories in light of current data from the CERN Large Hadron Collider (LHC). In particular, the case of heterotic string theory in which the dilaton is stabilized via non-perturbative corrections to the Kähler metric will be discussed. This model is highly constrained and therefore predictive. We find that most of the reasonable parameter space afforded to the model – representing the strong dynamics of a presumed gaugino condensation in the hidden sector – is now observationally disfavored by the LHC results. What limited parameter space that remains will be definitively explored within the first year of operation at $\sqrt{s} = 13\,\text{TeV}$, and much will be explored even before data-taking ends in 2013. Expected signatures for a number of benchmark points are discussed. This represents the first example of an explicit string-based model with the potential to be falsified by observational data. We find that the surviving space of the model makes a precise prediction as to the relation of many superpartner masses, as well as the manner in which the correct dark matter relic density is obtained. Implications for current and future dark matter search experiments are discussed.

Bryan Kaufman
Northeastern University

Date submitted: 10 Jan 2013 Electronic form version 1.4