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Discovering a Hidden Valley; Unusual Signals at Hadron Colliders
MATTHEW STRASSLER, KATHRYN ZUREK, University of Washington — We consider models in which a new confining gauge group is added to the standard model of particle physics. Many new neutral particles with low masses, long lifetimes, and observable decays at hadron colliders (the Tevatron and the LHC) often arise in these models, giving exotic signals. Production multiplicities of the new particles are often large; final states with heavy flavor quarks are common; displaced vertices and/or missing energy are possible. For illustration we consider the physics of a specific model. After accounting for LEP constraints, we find production cross-sections at the LHC are typically in the 1-100 fb range, though they can be much larger, in which case they may be observable at the Tevatron. We note that there is a possibility of discovering the Higgs boson through its rare decays to the new particles.

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