Abstract for an Invited Paper for the APR09 Meeting of The American Physical Society

Stating the Case for Top at the LHC KENNETH BLOOM, University of Nebraska-Lincoln

The top quark will be a fundamental element of the early physics program at the Large Hadron Collider. Thanks to the excellent work of the Tevatron experiments, top is now a reasonably well-understood standard model particle, and its production and decay, while often complex, are predictable. As such, the top quark will be a crucial instrument for the commissioning the ATLAS and CMS detectors and the experiments' tools for physics analysis. Once the top-quark signal has been established, the experiments will be able to use it to further probe the standard model, and to begin the search for new physics that the LHC is almost certain to deliver. Standard-model studies will be based around high-statistics measurements of top-quark properties (mass, branching fractions, decay dynamics). Newphysics exploration will be in topologies that are similar to those of top decay, and in channels where top production is an important background process. I will discuss the plans that CMS and ATLAS have to pursue this physics program, and the expected performance of the experiments, with a focus on what can be done in the earliest period of LHC operations.