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Physics with Dimuon Events at the Large Hadron Collider with the CMS Detector CHANG LIU, ADAM EVERETT, NORBERT NEUMEISTER, Purdue University, CMS COLLABORATION — The Large Hadron Collider (LHC), which is scheduled to begin operation in summer 2008, will collide proton beams at a center of mass energy of 14 TeV. The Compact Muon Solenoid (CMS) detector is one of the two general-purpose experiments at the LHC, which will probe the TeV frontier of energies to search for new phenomena. One of the most promising early discoveries can be achieved by checking the dimuon signature. Dimuon events can be explored by CMS with high precision up to very high invariant masses. We present a strategy to measure the inclusive dimuon cross section with the first available data, and discuss possible discovery scenarios of high-mass dimuon resonances by searching for deviations in the invariant mass differential cross section spectrum and the forward-backward asymmetry. These measurements require the development of dedicated methods to determine trigger, reconstruction, and selection efficiencies from data, which are discussed in detail.

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