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The ATLAS Hadronic Tau Trigger ELIZABETH CAITLIN BROST, University of Oregon, ATLAS COLLABORATION — As proton-proton collisions at the LHC reach luminosities close to 10^{34} cm^{-2} s^{-1}, the strategies for triggering have become more important than ever for physics analyses. Simplistic single tau lepton triggers suffer from severe rate limitation, despite the sophisticated algorithms used in the tau identification. The development of further fast algorithms and the design of topological selections are the main challenges to allow a large program of physics analysis. The tau triggers provide many opportunities to study new physics beyond the Standard Model, and to get precise measurements of the properties of the Higgs boson decaying to tau-leptons. We present the performance of the hadronic tau trigger taken in Run 1 data with the ATLAS detector at sqrt(s)=8TeV p-p collision. One of the major challenges is to sustain high efficiencies in events with multiple interactions. To do this we introduced faster tracking methods, multivariate selection techniques, and new topological criteria in the software trigger. We present measurements of the trigger efficiency using Z to tau tau events as the application to searches for tau tau resonances, such as the Higgs boson searches. We also outline the upgrade plan expected for Run 2 for the 14(13) TeV LHC pp collisions.

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