

Abstract Submitted  
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**The Fast Track Trigger upgrade for ATLAS** CONSTANTINOS MELACHRINOS, ANTONIO BOVEIA, University of Chicago, ATLAS COLLABORATION — The Large Hadron Collider will soon operate at a center of mass energy of 14 TeV and at high instantaneous luminosities of the order of  $10^{34}$  and  $10^{35}$  interactions per second, per  $\text{cm}^2$ . The sheer rate of collisions, combined with data processing and storage limitations of approximately 100 per second lead to the enormous challenge of selecting which events will be saved for further processing. The Fast Track Trigger (FTK) is an upgrade to the ATLAS trigger system that will provide nearly a factor of 1000 reduction in the time needed to identify b quarks and tau leptons. This is particularly important because many new TeV-scale physics scenarios, as well as the Higgs boson searches, involve these particles. The efficient reconstruction of these particles at the trigger level will enable us to improve the experiment's sensitivity to these rare physics processes. In this talk, we will describe how the FTK system plans to operate, and how it will enable ATLAS to make smarter trigger decisions earlier in the trigger process. We will also discuss the current hardware design architecture and the challenges that the FTK team will face in the implementation of the system. FTK is an essential upgrade for ATLAS to reach its full potential for discovering new physics processes.

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