LHCP2021
The Ninth Annual Conference on Large Hadron Collider Physics
Online
7-12 June 2021 Paris (France), Sorbonne Université (IN2P3/CNRS,IRFU/CEA)

Contribution ID: **298** Type: **Experimental poster**

Fast simulation of a Time-of-Flight detector for Forward Protons at the LHC

Thursday, 10 June 2021 18:45 (1 hour)

The ATLAS Forward Proton physics program at CERN aims at studying soft and hard diffractive events from ATLAS proton collisions. Time-of-Flight (ToF) system is used to reduce the background from multiple proton-proton collisions. In this presentation, we describe technical details of the Fast Cherenkov model of photons generation and transportation through the optical part of the ToF detector. This Fast simulation uses Python programming language and Numba (high performance compiler). It is about 200 times faster than Geant4 simulation already implemented, and provides similar results concerning length and time distributions of photons. Moreover, this Fast simulation allows computing easily the time resolution of the different bars of ToF detector.

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Session Classification: Poster Session

Track Classification: Performance