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Upgrade of the ALICE Time Projection Chamber AUSTIN SCHMIER, University of Tennessee, ALICE COLLABORATION[1] — The ALICE Time Projection Chamber (TPC) is a gaseous drift chamber used to study proton-proton and heavy ion collisions at the large hadron collider (LHC). The LHC is currently undergoing a major upgrade that will increase the event rate from 1 kHz to 50 kHz and the TPC is therefore being upgraded to handle the increased event rate. The current ALICE TPC uses multi-wire proportional chambers in conjunction with a gated grid to reduce ion backflow, which limits readout to ˜3 kHz. There is a readout deadtime of roughly 400 ãŽ. The new design will use gaseous electron multiplier (GEM) foils, allowing for reduced ion backflow and a continuous readout, meeting the 50 kHz requirement. The TPC upgrade will also require 3,600 new front end cards (FECs), each with 128 channels, in order to read the signal from the GEM foils. The FECs amplify, shape, digitize, process, and buffer the signals from the TPC. The physics motivations for the upgrade and the current progress of the construction and testing of the upgraded TPC will be discussed.

[1]ALICE collaboration at CERN

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