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A calorimeter cell timing cut in ATLAS topo-cluster reconstruction

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Calorimeter topo-clusters are the basic ingredient to the reconstruction of jets, electrons photons and tau leptons in the ATLAS experiment. Due to the long integration time, the calorimeters are susceptible to energy deposits from adjacent out-of-time collisions. Reducing the impact of Pile-Up on calorimeter signal reconstruction is fundamental to improve reconstruction efficiency as well as computing resources consumption. This poster presents an improved version of the ATLAS topo-cluster making algorithm, by including a cut on signals??? timing, as measured by the ATLAS calorimeters. The new algorithm performance in hadronic signals reconstruction is evaluated on both Monte Carlo simulation and Run 2 ATLAS data. The new algorithm is found to significantly reduce the effect of Out-Of-Time Pile-Up and has been adopted for topo-cluster building in Run 3.

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