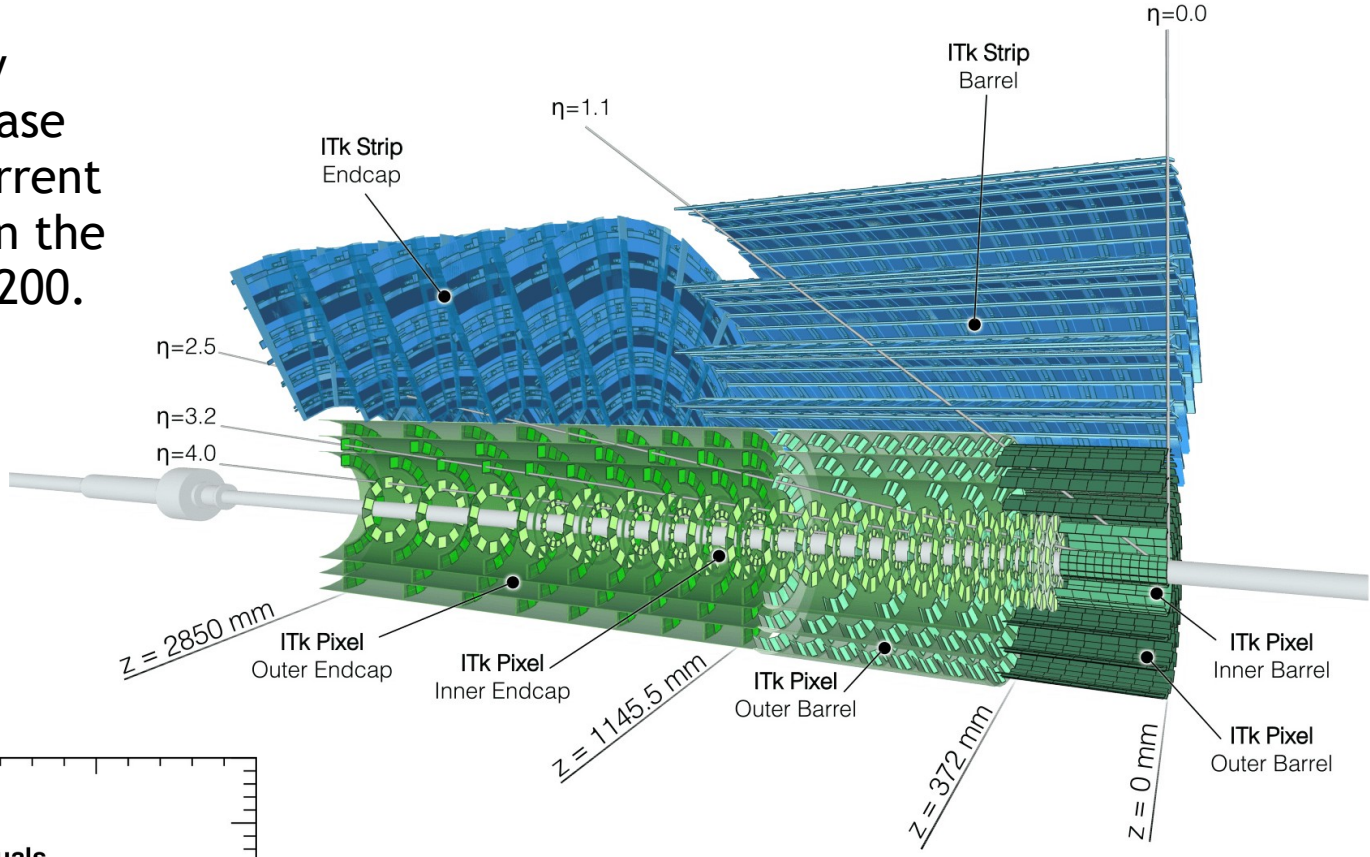
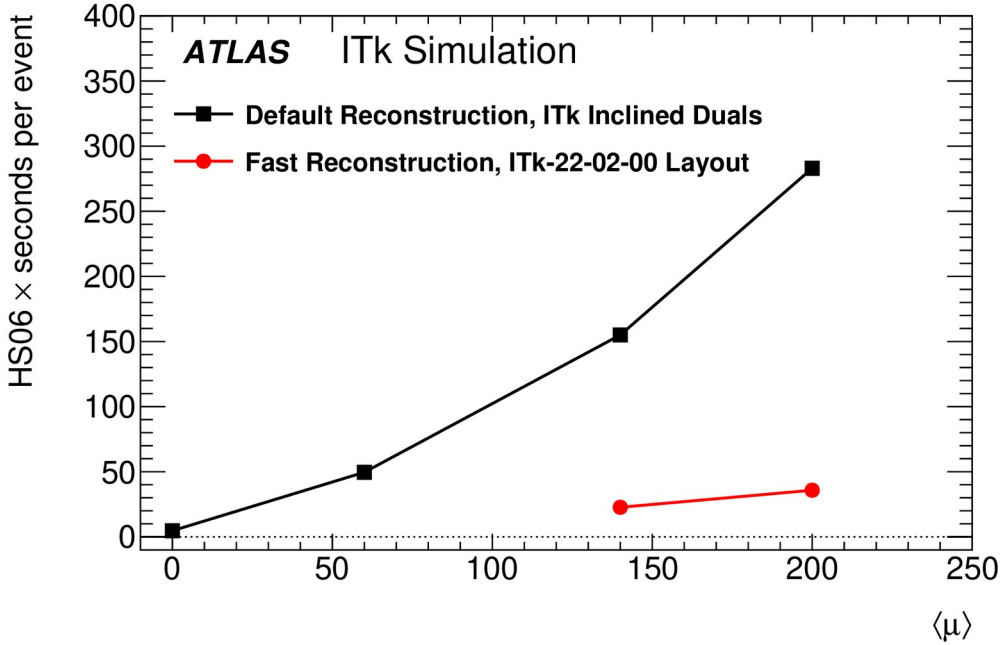
82: Regional reconstruction of tracks for the ATLAS Event Filter using GPU accelerators - Benjamin Wynne

The upcoming high-luminosity upgrade to the LHC will increase the average number of concurrent proton-proton collisions <μ> in the ATLAS detector from ~60 to ~200.

An upgraded tracking detector, the ITk, will be installed.



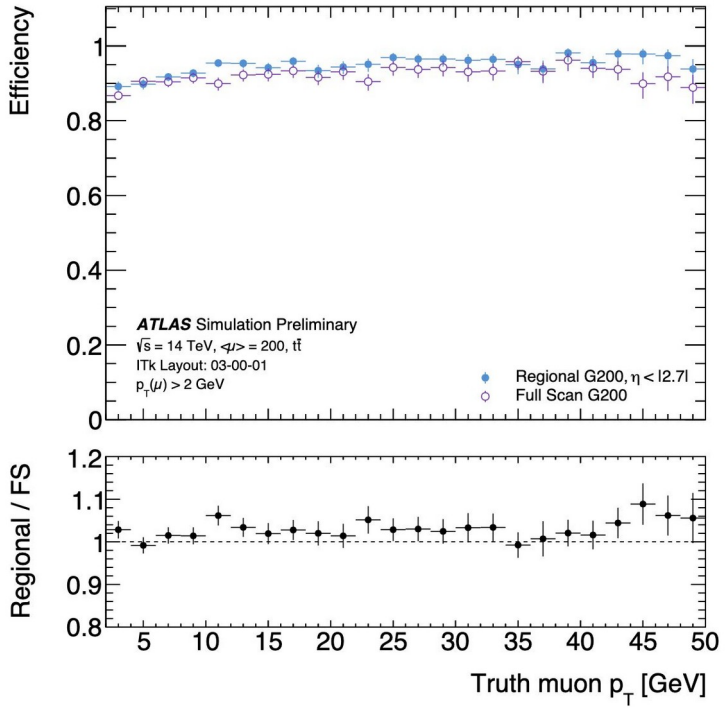


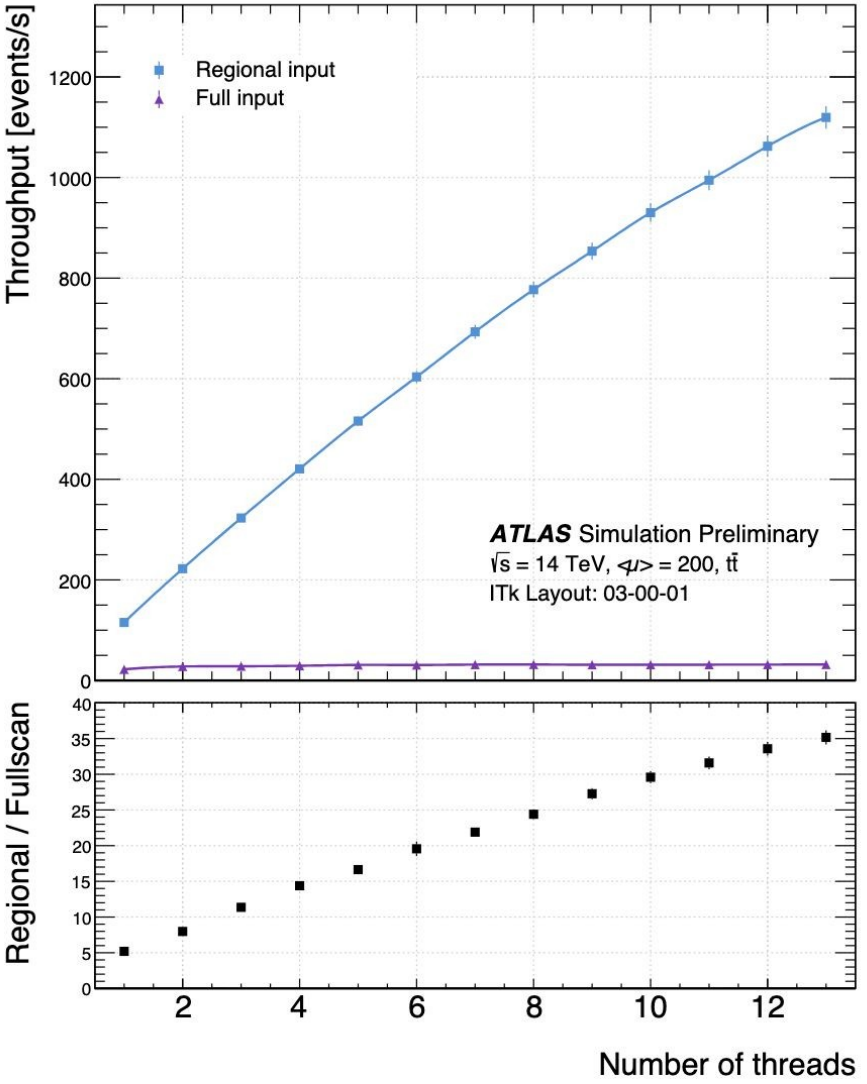
Increased detector hits and track candidates lead to a non-linear scaling of compute requirements for track reconstruction. A new Event Filter processor farm will be commissioned with GPU accelerators.

82: Regional reconstruction of tracks for the ATLAS Event Filter using GPU accelerators - Benjamin Wynne

The Event Filter is required to process events at 150 kHz, but also to reconstruct "Regions of Interest" comprising ~5% of the full detector space, at a rate of 1 MHz.

Prototype track reconstruction workflow incorporating GPU algorithms was evaluated for both full detector and regional processing





Prototype shows good performance scaling for regional reconstruction, without loss of tracking efficiency