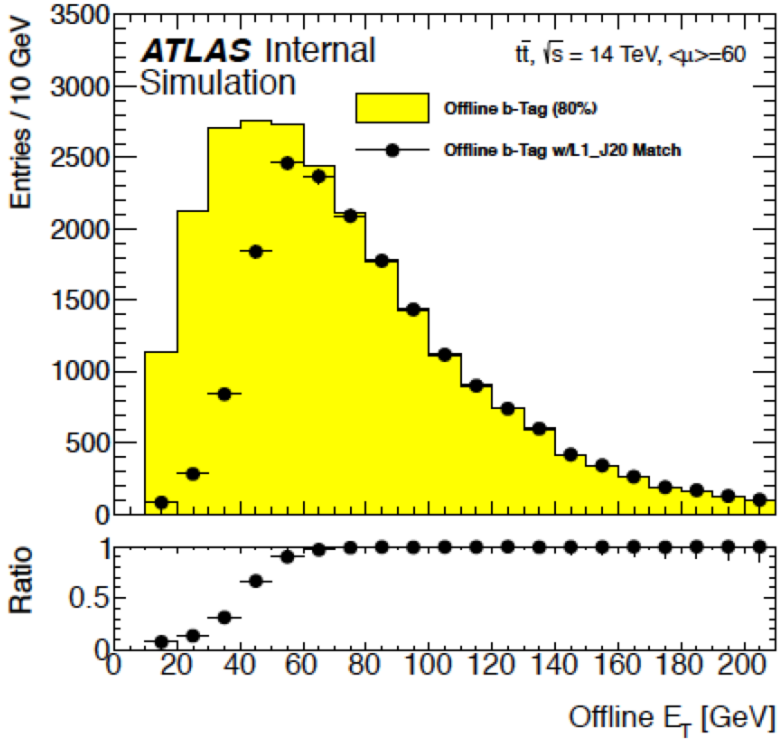
Plots for approval

Plots show the efficiency to match offline b-tagged jets with L1_J20 triggered jets and with FTK-based track jets

For approval:



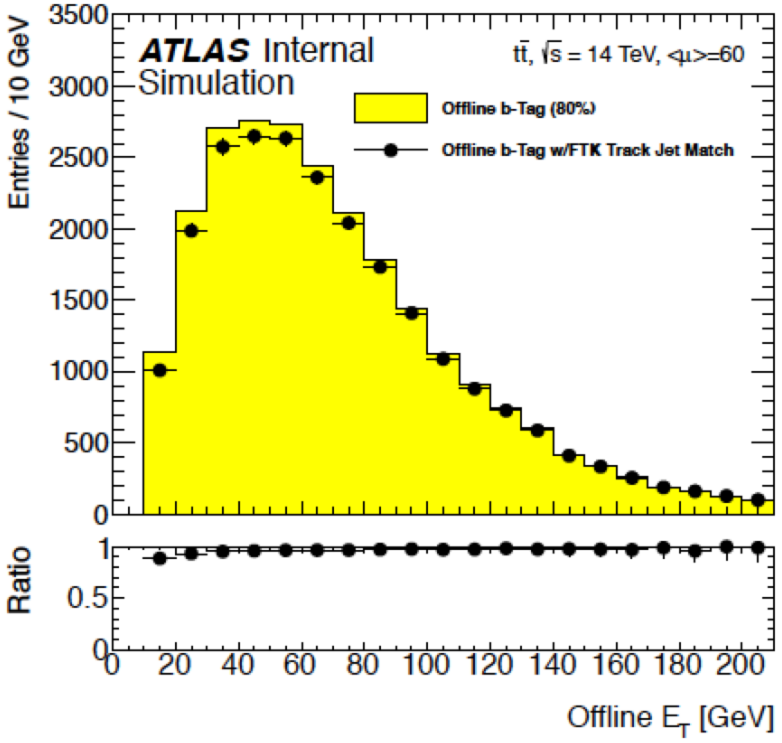


Figure 1: E_{T} distribution for offline b-tagged jets in simulated $t\bar{t}$ events. The offline jets, shown in yellow, are reconstructed using the anti-k_t(R=0.4) algorithm and are required to have $|\eta| < 2.5$ and satisfy the 80% working point of the IP2D b-tagging algorithm [ATLAS-CONF-2010-091]. The black points show the sub-set of offline jets matching a 20 GeV L1 jet (left) or an FTK track-jet (right). FTK track jets are reconstructed from FTK tracks [CERN-LHCC-2013-007] with $|z_0 \times sin(\theta)| < 2$ mm using the anti-k_t(R=0.4) algorithm. The z_0 is calculated with respect to the primary vertex found using the FTK tracks. The FTK track jets are required to consist of at least two tracks and have transverse momentum greater than 5 GeV. L1 jets are reconstructed from trigger towers using a sliding window algorithm. The bottom panels show the ratio of the matched jets to the full unbiased distribution. The high CPU consumption required by the tracking in the High Level Trigger means for b-tagging, the tracking must be seeded by jets found at L1 with a reasonably high ($\sim$ 20 GeV) E_{T} threshold in order to reduce the rate to a level where the tracking can be performed. With the FTK, full scan b-tagging can be performed at the full Level 1 output rate, independently of jets found at L1. This can increase the trigger acceptance for b-jets at low transverse energies in events triggered at Level 1 by additional signatures besides the b-jets themselves. In addition, where the jet E_{T} is low, the FTK tracks can help to distinguish jets from the primary interaction from additional low E_{T} jets arising from pileup interactions.