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Boosted object hardware trigger development and testing for the Phase I upgrade of the ATLAS Experiment GIORDON STARK, Univ of Chicago, ATLAS COLLABORATION — The Global Feature Extraction (gFEX) module is a Level 1 jet trigger system planned for installation in ATLAS during the Phase 1 upgrade in 2018. The gFEX selects large-radius jets for capturing Lorentz-boosted objects by means of wide-area jet algorithms refined by subjet information. The architecture of the gFEX permits event-by-event local pile-up suppression for these jets using the same subtraction techniques developed for offline analyses. The gFEX architecture is also suitable for other global event algorithms such as missing transverse energy (MET), centrality for heavy ion collisions, and "jets without jets." The gFEX will use 4 processor FPGAs to perform calculations on the incoming data and a Hybrid APU-FPGA for slow control of the module. The gFEX is unique in both design and implementation and substantially enhance the selectivity of the L1 trigger and increases sensitivity to key physics channels.

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