

Searching for dijet resonances with the ATLAS trigger

Falk Bartels

Kirchhoff-Institut für Physik, Universität Heidelberg

Searches for dijet resonances are among the most inclusive strategies for exploring physics beyond the Standard Model at the LHC, as new mediators producible in proton-proton collisions are expected to also decay into dijet final states. However, the overwhelming QCD multijet background presents a significant challenge, necessitating high jet trigger thresholds to manage event rates. As a result, standard dijet resonance searches in ATLAS and CMS are typically limited to probing masses above 1 TeV with full statistical precision.

This talk presents the recently published ATLAS trigger-level analysis targeting dijet resonances with masses as low as 375 GeV. This approach circumvents the otherwise limiting trigger thresholds by recording a reduced set of jet variables reconstructed at the High-Level Trigger. Exceptional statistical precision is achieved through this method, with over one billion events collected in the dijet mass spectrum. The talk will highlight the unique challenges posed by this precision, particularly regarding the calibration of trigger-level jets and the QCD background estimation.