Search for physics beyond the standard model with the CMS experiment, with focus on boosted topologies

Dr. Alexander Schmidt

Universität Hamburg

The direct search for physics beyond the standard model (BSM) is the primary task of the ATLAS and CMS experiments at the LHC. This search was not yet successful. The currently ongoing Run-II of the LHC represents a unique chance to discover BSM particles which are predicted by a variety of models that are trying to explain the open questions of particle physics.

One striking feature common to many of these new models is that the couplings with third-generation quarks are enhanced. This results in final states containing b quarks, vector bosons, Higgs bosons and top quarks that can have significant Lorentz boosts, so that their individual decay products often overlap and merge. Such "boosted topologies" can be exploited thanks to dedicated reconstruction algorithms that were developed and became well established in during Run-1 of the LHC. These algorithms are even more important in Run-2 because of the increased energy. In this talk the searches for new physics of the CMS experiment will be reviewed and special focus will be on those searches that apply jet substructure methods.