

NUCLEAR AND SUBNUCLEAR PHYSICS

Study of top quark properties in proton-proton collisions by ATLAS experiment

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study form: full time

Annotation: Top quark, which is the heaviest of all known quarks, has the extraordinary properties for analysis of processes which could reveal physics beyond Standard Model (SM), eventually they could predict SM parameters with higher precision. ATLAS detector is delivering top quark production and decay data for the highest energy ever and with high production statistics. There is a need to analyze these data for many processes (cross-sections, spin correlations, branching ratios,..), as well as repeat with higher precision the analyzes done with lower energies and less statistics. The PhD study will be focused on methodological tasks on ATLAS calorimetry (contribution to data quality improvement in the high luminosity environment of the future HL-LHC accelerator), as well as to some of these data analyzes (according collaboration needs and ability). The work suppose to acquire knowledge of programming in the ROOT analysis environment and in the ATLAS software environment (python and C++). The understanding of theoretical SM prediction will be needed, as well as good communication skills in English (frequent presentations on collaboration meetings).