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## Physics of ridge and hard processes in proton-lead and lead-lead collisions with the ATLAS Experiment

*Wednesday 14 March 2018 11:00 (30 minutes)*

Correlations between two particles separated in pseudorapidity and azimuthal angles, phenomena often called ridge, are sensitive to collective multiparticle effects, and have shown striking similarities in results obtained from proton-proton, proton-lead and lead-lead collisions. This talk presents an overview of ATLAS measurements of azimuthal correlations in proton-proton and proton-lead collisions, with some comparisons to lead-lead data. A detailed study of the dependence of two-particle correlations on the charged particle multiplicity, transverse momentum of the pair constituents and the pseudorapidity separation between particle pairs is presented. This talk presents also the latest results on the jet, quarkonia and heavy flavor production, measured in proton-lead and lead-lead collisions using ATLAS. Modifications of yields and properties of jets propagating through the hot and dense medium created in lead-lead collisions should provide insight on the structure of the medium, as well as on the dynamics of the parton energy loss. Quarkonia play an equally important role in studying the hot and dense medium, as they are observed to have modified yields in both proton-lead and lead-lead collisions relative to proton-proton collisions.

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