



Contribution ID: 52

Type: not specified

## Measurement of two-particle hadron-hadron and muon-hadron correlations in $pp$ and $p+Pb$ collisions with the ATLAS detector

*Tuesday, 19 September 2017 14:50 (20 minutes)*

ATLAS measurements of two-particle correlations in  $\Delta\phi$  and  $\Delta\eta$  are presented for  $pp$  collisions at 2.76, 5.02 and 13 TeV, and for  $p+Pb$  collisions at 5.02 and 8.16 TeV. A template fitting procedure is used to subtract the dijet contribution and to extract the genuine long-range ridge correlations. In all collision systems, the ridge correlations are shown to be present even in events with a low multiplicity of produced particles, implying that the long-range correlations are not unique to rare high-multiplicity events. The measured correlations in  $pp$  collisions are shown to exhibit only a weak energy dependence and are found to be remarkably similar to those observed in  $p+Pb$  collisions. The measurements are extended to correlations where one of the particles comes from decays of heavy-flavor particles. Significant long-range correlations are observed for particle pairs containing the heavy-flavor muon with similar features as the inclusive hadron pairs. This presentation also includes a new, detailed study of ridge properties in collisions with hard processes, characterized by large four-momentum transfer. This may help answering the question whether the ridge arises from hard or semi-hard processes, or if it is the result of mechanisms unrelated to the initial hardness scale.

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**Session Classification:** Small systems