



Contribution ID: 372

Type: **Parallel Talk**

## Importance of initial and final state effects for azimuthal correlations in p+Pb collisions

*Tuesday, May 15, 2018 3:00 PM (20 minutes)*

We investigate the relative importance of initial and final state effects on azimuthal correlations in low and high multiplicity p+Pb collisions at LHC energies. By matching the classical Yang-Mills dynamics of pre-equilibrium gluon fields (IP-GLASMA) to a perturbative QCD based parton cascade for the final state evolution (BAMPS) on an event-by-event basis, we find that signatures of both the initial state correlations and final state interactions are seen in azimuthal correlation observables, such as  $v_2\{2PC\}(p_T)$ , with their relative strength depending on the event multiplicity and transverse momentum. Initial state correlations dominate elliptic flow in low multiplicity events for transverse momenta  $p_T > 2$  GeV. While final state interactions are dominant in high multiplicity events and at low momenta, we find that initial state correlations strongly affect  $v_2\{2PC\}(p_T)$  for  $p_T > 2$  GeV as well as the pT integrated  $v_2\{2PC\}$ . By carrying out a systematic multiplicity scan, we can also probe the dynamics on the border of initial state dominated to final state dominated - but not yet fully developed hydrodynamic - regime. We predict at which multiplicity and transverse momentum many-body QCD effects in the initial state can be experimentally unveiled.

Reference: Greif, Greiner, Schenke, Schlichting, Xu: Phys. Rev. D 96, 091504, 2017

### Content type

Theory

### Collaboration

### Centralised submission by Collaboration

Presenter name already specified

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**Session Classification:** Collectivity in small systems

**Track Classification:** Collectivity in small systems