Event-shape-dependent analysis of charm-anticharm correlations in simulations

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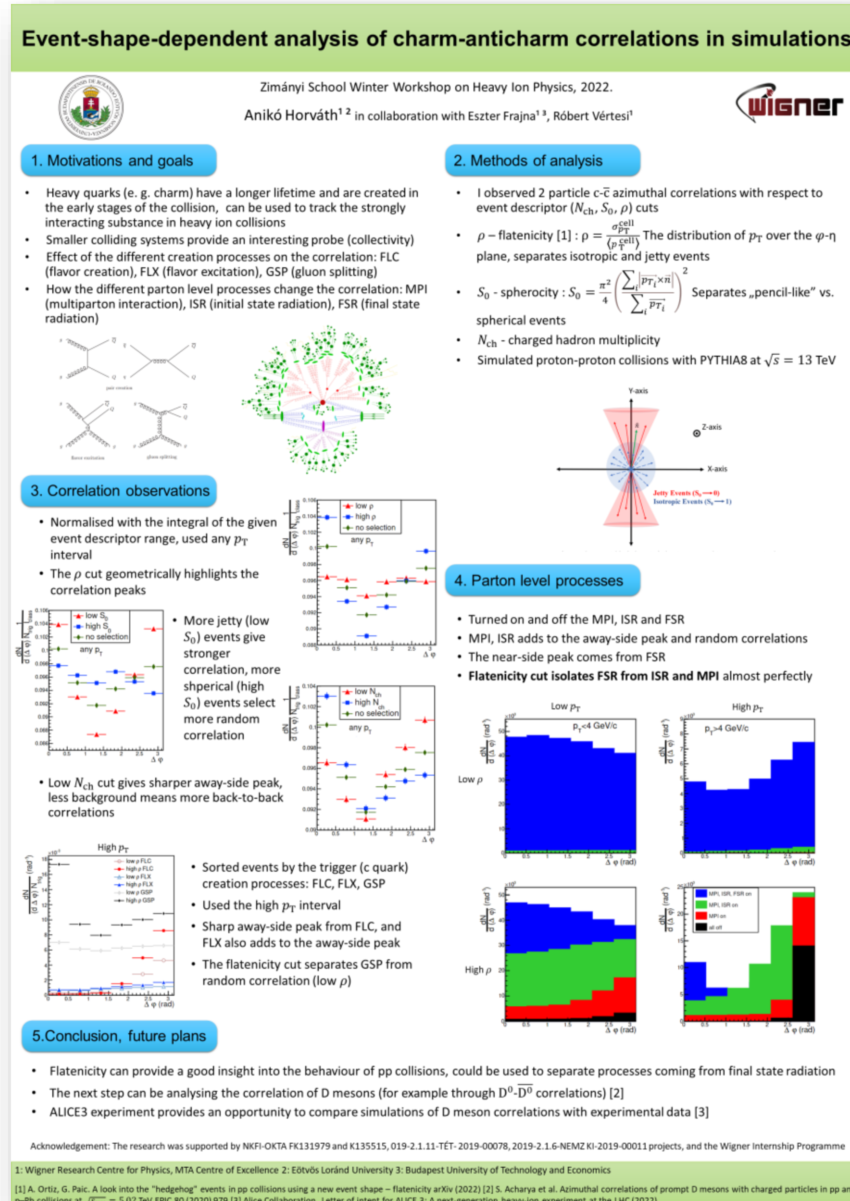

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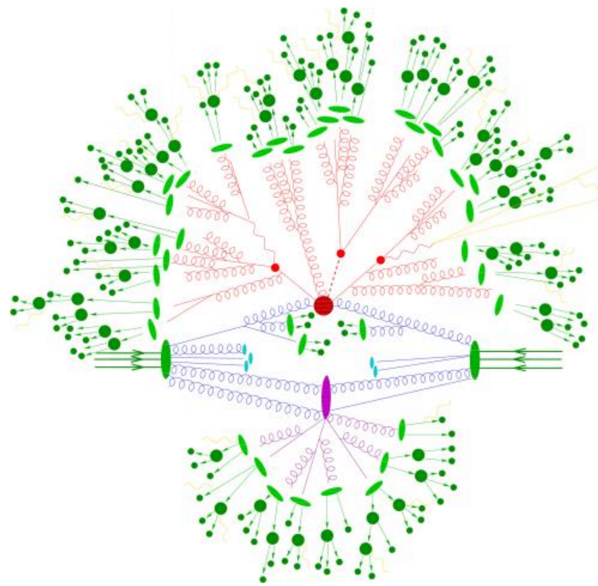
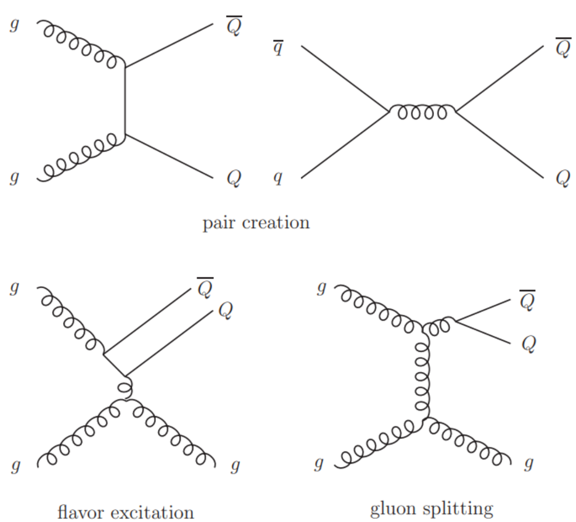
Motivation

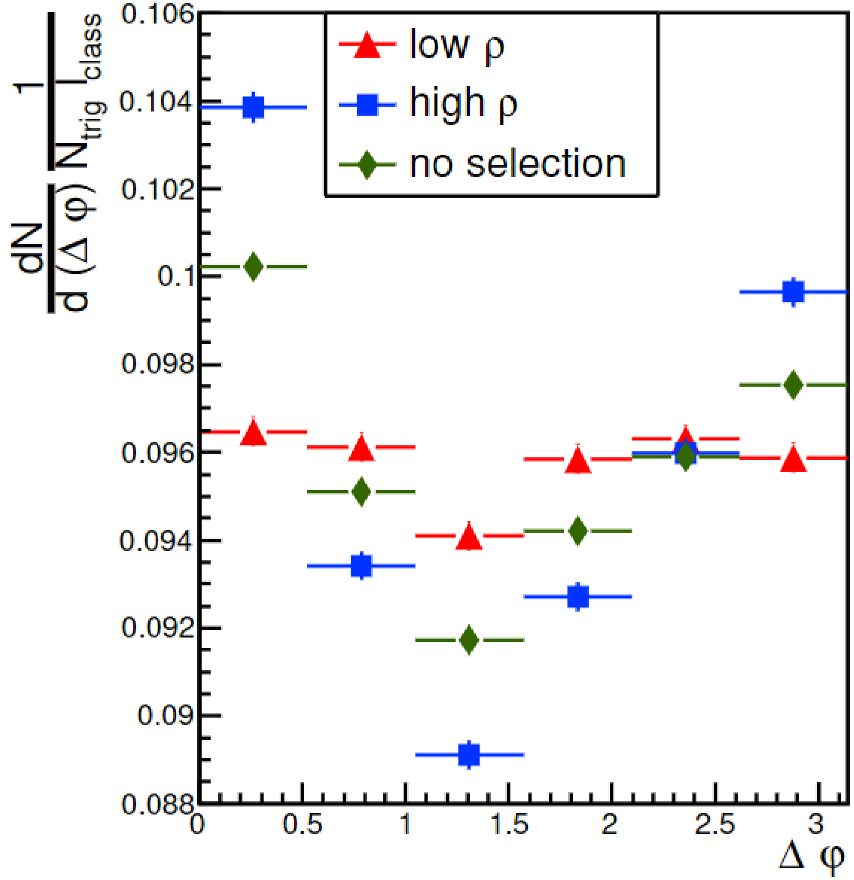
- In heavy ion collisions, heavy quarks (charm) can be used to track the behaviour of the collision (long lifetime)
- Smaller collision systems provide an interesting probe (collectivity)
- Effects of parton level processes (multiparton interaction (MPI), initial (ISR) and final state radiation (FSR))
- Effect of quark creation process on the correlation: flavor creation, flavor excitation, gluonsplitting





Methods

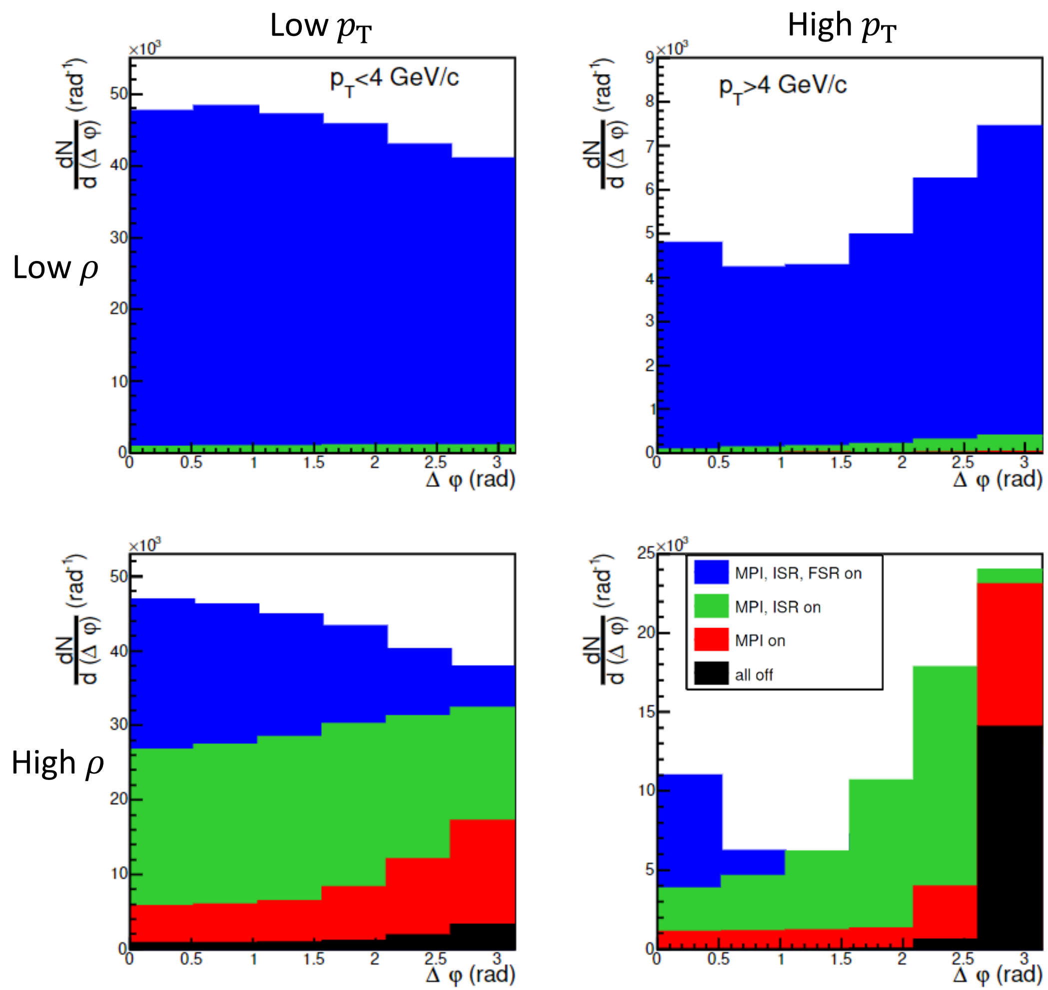
- I used 2 particle c-$\bar{c}$ azimuthal correlations with respect to event descriptors (N_{ch}, S_0, ρ)
- Flatenicity: the distribution of p_{T} in the φ-η plane
- ρ highlights the correlation peaks
- Simulated pp (proton-proton) collisions with PYTHIA8 ($\sqrt{s} = 13$ TeV)



$$\rho = \frac{\sigma_{p_{\mathrm{T}}}^{\mathrm{cell}}}{\langle p_{\mathrm{T}}^{\mathrm{cell}} \rangle}$$

Parton level processes

- Low: $p_{\mathrm{T}} < 4$ GeV/c,
  High: $p_{\mathrm{T}} > 4$ GeV/c
- Hard process, MPI, ISR: away-side peak, random correlations
- FSR: near-side peak



- **Flatenicity cut isolates FSR from ISR and MPI both at low and high p_T**