

Centrality, event activity and direct photons in small-on-large collisions

While collision centrality for large heavy ion systems is well defined both theoretically and in the experiments, the same is not true when very asymmetric systems (like p/d+A) collide. In light of some surprising and in part contradictory results on the centrality dependence of certain observables in p/d+A collisions that emerged since 2012 from RHIC and LHC, the very concept of the geometrically inspired centrality gave way to “event activity”. Several phenomenological models try to explain the counterintuitive results, but convincing experimental tests of the diverging concepts are so far missing. After a critical review of the relevant results from SPS, RHIC and LHC we will discuss whether and how the measurement of the “centrality” dependence of high and low transverse momentum direct photons (pQCD and “thermal”) in p/d+A collisions can help us break the impasse. We will also explore whether there are any lessons to be learned with respect to extreme event classes in p+p and A+A collisions.

Summary

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Session Classification: Poster Session