

## Centrality vs event activity in small-on-large collisions

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Determining the collision geometry event-by-event from experimental observables is important in the quantitative study of initial and final state (medium) effects in relativistic heavy ion collisions. When two large ions collide, the mapping between true impact parameter (centrality) and the observable event activity via the Glauber-model is straightforward and uncontroversial. This is true even in events where a hard collision occurred and high  $PT$  jets were produced. The situation is quite different in so-called small systems (like p+Pb, p+Au, d+Au,  $^3\text{He}+\text{Au}$ ). We will discuss data and various models that attempted to explain some controversial results on nuclear modification factors of jets and hadrons, demonstrate the importance of electroweak probes, that are unaffected by the final state (medium) and show how can they be used to derive a purely experimental number of binary collisions. Finally we discuss how the system-size dependence of photon/hadron ratios can differentiate between energy conservation, initial state or possible residual final state effects on the measured nuclear modification factors.

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