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Systematic uncertainties in heavy ion collision centrality measures[1] LANNY RAY, MICHAEL DAUGHERITY, The University of Texas at Austin — The collision centrality for relativistic heavy-ion scattering events is often reported in terms of geometrical quantities using a model to relate the latter to multiplicity [1]. Using a Monte Carlo Glauber model the accuracy of several geometrical measures is reported for collision systems relevant to the RHIC program. The measures include impact parameter, number of interacting nucleons (N_{part}), number of binary interactions (N_{bin}), and the average number of binary collisions per incident participant nucleon $\nu = N_{bin}/(N_{part}/2)$ for Au-Au collisions at $\sqrt{s_{NN}}$ = 20, 62, 130 and 200 GeV and Cu-Cu at 62 and 200 GeV. Systematic uncertainties in the centrality measures due to errors in the matter densities, nucleon-nucleon cross section, multiplicity production model, and measured multiplicity frequency distribution are estimated. We find that the impact parameter is most accurately determined, followed closely by ν. Centrality measures N_{part} and N_{bin} can be significantly affected by experimental uncertainties in the multiplicity frequency distribution [1], particularly that caused by trigger and primary vertex finding inefficiencies for low multiplicity events. Combined systematic errors for each collision system are given.
[1] C. Adler, et al., Phys. Rev. Lett. 87, 112303 (2001).

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