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Multiple particle production in deformed nuclei collisions in the framework of the modified Glauber model

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In this talk we present the results of further development of the Monte Carlo modified Glauber model (MGM) [1], [2], [3] for deformed nuclei collisions at high energy. Our model differs from the Standard Glauber model by effectively accounting for energy losses in successive nucleon-nucleon collisions; we also account for the associated decrease in the inelastic nucleon-nucleon interaction cross section. The case of deformed nuclei appears to be interesting, because nuclei orientation before collision —whether it is of a tip-on-tip type or side-on-side, etc —were expected to affect significantly the multiparticle production. We discuss our results, obtained in the framework of the MGM with only one parameter, and compare them at the LHC energies, to the effects of nonlinearity observed for the normalized charged particle yields vs. centrality in collisions of deformed nuclei : Cu+Cu and Xe+Xe. We compare the results to the case of Pb+Pb collisions and argue that the explanation of these nonlinear effects is purely geometrical and the role of deformation is not the main one.

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[3] S. Simak and G. A. Feofilov, Phys. Part. Nucl. 56, 877 (2025).

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