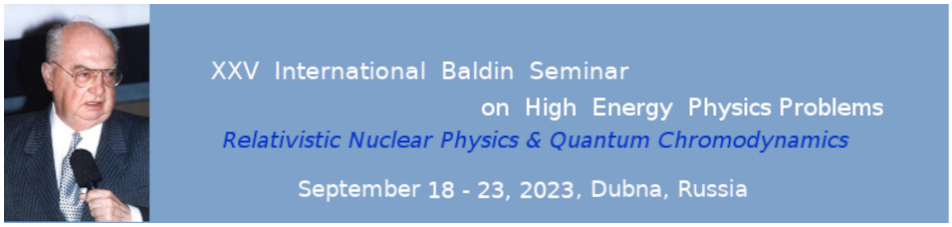

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Glauber modelling of the relativistic nuclear collisions at partonic level

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Glauber approach is widely used for describing multiparticle production in the interactions involving hadrons and nuclei in a wide energy range [1-2]. For the more detailed description of nuclear interaction features, this model is increasingly being used at the parton level [3-6], however, usually, the pp-interaction is given insufficient attention.

Before application of the model to nucleus-nucleus collisions, one has to ensure that the major features of the pp interaction are adequately described.

In this regard, in this work the parton-based Monte Carlo model [7] is developed and generalized to proton-nucleus and nucleus-nucleus collisions. It is demonstrated that in pp-collisions the total, elastic, and inelastic cross sections, the slope of the diffraction cone in the energy range from SPS to LHC are satisfactorily described. Using the condition of self-consistency of the model under Lorentz transformations, an explicit form of the dependence of the number of initial partons on the beam energy is obtained, allowing minimization of the number of free parameters.

The model is applied to p-Pb and Pb-Pb collisions at LHC energy. The relation of this approach to Modified Glauber model [8], Multipomeron Model [9], string fusion and percolation model [10] and dipole-based Monte Carlo model [11] is discussed.

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1. R.J. Glauber, Phys. Rev. 100, 242 (1955)
2. M.L. Miller, et al, Ann. Rev. Nucl. Part. Sci. 57, 205-243 (2007)
3. S. Eremin, S.Voloshin, Phys. Rev. C. 67, 064905 (2003)
4. C. Loizides, Phys.Rev.C 94, 024914 (2016)
5. M. Deliyergiyev, M. Rybczynski, Phys. Rev. C 101, 014909 (2020)
6. S. Deb, G. Sarwar, D. Thakur, Pavish S. et al, Phys. Rev. D 101, 014004 (2020)
7. V. Mikhailovsky, V. Kovalenko, Phys. Part. Nucl. 53, 556-562 (2022)
8. G. Feofilov, A. Ivanov, J. Phys. Conf. Ser. 5, 230 (2005)
9. V. Kovalenko, G. Feofilov, A. Puchkov, F. Valiev, Universe 8, 246 (2022)
10. E.G.Ferreiro, C.Pajares, Nucl. Phys. A, 642, c143-c148 (1998)
11. V. Kovalenko, Theor. Math. Phys. 184, 1295-1303 (2015)

Primary author: KOVALENKO, Vladimir (Saint Petersburg State University)

Presenter: KOVALENKO, Vladimir (Saint Petersburg State University)

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