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Mathematical modeling of experiments at the Nuclotron.

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The aim of this work is to present shortly the Monte Carlo Models: LAQGSM, FRITIOF and a MCNPX code for calculations of experiments at the NUCLOTRON. The examples of experiments at the Synchrophasotron/Nuclotron complex with reactions p(1.5 GeV)+Pb and d (4 GeV) +U were presented. Spectra of protons and π mesons in p+Pb interactions were calculated and compared with experimental data in momentum range from 3 to 15 GeV/c. Possible applications of the LAQGSM and FRITIOF models in relativistic nuclear physics were discussed. The perspectives of using of MCNPX (LAQGSM) code and Geant4 (FRITIOF) code for calculations of construction of Nuclotron-based Ion Collider and detectors were analyzed. The hadron productions (multiplicity, Pt etc.) for different ions from p to Pb or Au by scanning in b and energy in the range from 3 to 11A GeV were evaluated.

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