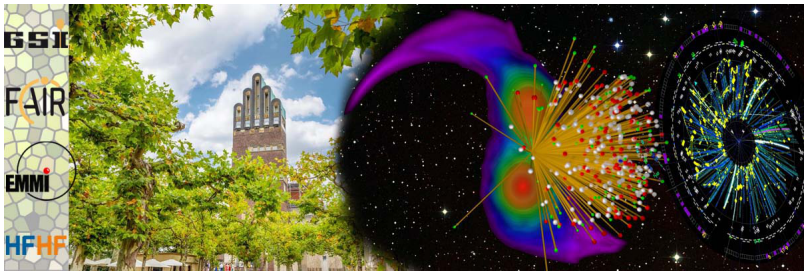

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Kinetic approach of light-nuclei production in intermediate-energy heavy-ion collisions

Tuesday, 19 September 2023 09:45 (25 minutes)

We develop a kinetic approach to the production of light nuclei up to mass number A = 4 in intermediate-energy heavy-ion collisions by including them as dynamic degrees of freedom. The conversions between nucleons and light nuclei during the collisions are incorporated dynamically via the breakup of light nuclei by a nucleon and their inverse reactions. We also include the Mott effect on light nuclei, i.e., a light nucleus would no longer be bound if the phase-space density of its surrounding nucleons is too large. With this kinetic approach, we obtain a reasonable description of the measured yields of light nuclei in central Au+Au collisions at energies of 0.25 - 1.0A GeV by the FOPI collaboration. Our study also indicates that the observed enhancement of the α-particle yield at low incident energies can be attributed to a weaker Mott effect on the α-particle, which makes it more difficult to dissolve in nuclear medium, as a result of its much larger binding energy.

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