

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

giovedì 12 ottobre 2023 14:50 (20 minuti)

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.

Autore principale: WANG, Rui (Istituto Nazionale di Fisica Nucleare)

Relatore: WANG, Rui (Istituto Nazionale di Fisica Nucleare)

Classifica Sessioni: Nuclear structure and reactions (III)