

Emission characteristics of fast target protons in ultrarelativistic ^{16}O –nucleus collisions

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Abstract: The target fragmentation in 60A and 200A GeV ^{16}O interactions with emulsion nuclei is analyzed. The validity of the nuclear limiting fragmentation hypothesis is confirmed at ultrarelativistic energies. The emission mechanism of the fast target proton (grey particle) is investigated in terms of the multiplicity characteristics. The anisotropy ratio and asymmetry parameter, while found to be independent of the projectile size or incident energy, are dependent on the target size and system centrality. This dependence is insignificant for heavy targets and in more central regions, where constancy exists. In this species, the system of the grey particle emission cannot exhibit the optimum symmetry or asymmetry between the forward and backward hemispheres. It is seen that these target protons originate from two emission sources in the earlier stage of the target fragmentation. One them emits nucleons isotropically in the 4_+ space. The other is the main emission source, which emits nucleons, in the forward hemisphere only, as a result of the binary nucleon–nucleon collisions and (or) intranuclear cascade.

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