

XXV International Baldin Seminar on High Energy Physics Problems "Relativistic Nuclear Physics and Quantum Chromodynamics"



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Observations of projectile neutrons in the relativistic fragmentations

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The study of nuclear multifragmentation in the relativistic energy region provides valuable insights into nuclear clusters and fragmentation characteristics. In this context, the Nuclear Track Emulsion (NTE) detector has been used in the BECQUEREL experiment to analyse the cluster structure of light nuclei, including radioactive ones [1]. NTE detector possess the significant advantages over other detectors. A nuclear emulsion detector with exceptional resolution and high sensitivity used to study the created ensembles H and He as well as a variety of neutrons. The investigation of unstable nuclei, including $8\text{Be} \rightarrow 2\alpha$, $9\text{B} \rightarrow 2\alpha p$, and the Hoyle states ${}^8\text{B} \rightarrow 3\alpha$, has been accomplished successfully through the application of relativistic fragmentation [2-3]. The present study focus on the neutron multiplicities observed from 84Kr emulsion interactions at energies below 1 GeV per nucleon in order to comprehend their characteristics. The emulsion plates were horizontally exposed at GSI Germany. The events collected for the present analysis were obtained through the transverse scanning method using the Olympus BX63 microscope. The distance of the neutrons have measured from interaction vertex, and their transverse momentum are calculated from the planer angle observations. The primary analysis reveals that the majority of the neutrons concentrated a region of up to 4 mm and their average transverse momentum of neutrons, including volume factor are 50 MeV/c.

References

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Primary author: MARIMUTHU, N (Joint Institute for Nuclear Research)

Co-authors: Dr ZAITSEV, Andrei (JINR, LHEP); Prof. ZARUBIN, Pavel Igorevich (Joint Institute for Nuclear Research)

Presenter: MARIMUTHU, N (Joint Institute for Nuclear Research)

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