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Slow Particle Production in Nucleus-Nucleus Collisions at Relativistic Energies

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Abstract

In this paper an effort has been made to study the general characteristics of slow particles produced in the interactions of ^{32}S-Em at 200 AGeV to extract the information about the mechanism of particle production. The results have been compared with the experimental results obtained by other workers. The multiplicity distributions of the slow target associated particles (black, grey and heavy tracks) produced by ^{32}S-beam with different targets have been studied. Also several types of correlations among them have been investigated. The variation of the produced particles with projectile mass number and target size has been studied. Also the multiplicity distributions of slow particles with NBD fits are presented and scaling multiplicity distributions of slow particles produced have been studied in order to check the validity of KNO-scaling.

Keywords

Relativistic Heavy-Ion Collisions, Nuclear Emulsion, Multiplicity Distribution, Multiplicity Correlations, KNO Scaling, Negative Binomial Distribution

1. Introduction

The study of relativistic nucleus-nucleus (A-A) collisions has attained peculiar importance during the last few decades. In nucleus-nucleus collisions it is important to achieve complete information regarding the mechanism of particle production. When an energetic projectile collides with targets of nuclear emulsion, a number of charged and uncharged particles are produced. The emergence of these particles occurs in a very short time and after this the nucleus remains excited for quite a long time on nuclear scale. The nucleus then de-excites resulting in the emission of a large number of nucleons and other heavy fragments. Usually, the particles emitted

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