Chapter 10
Multiplicity Characteristics of Forward-Backward Emitted Particles in Heavy-Ion Interactions at SPS Energies

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Abstract The experimental multiplicity distributions of relativistic shower particles emitted in forward ($\theta_{lab} < 90$) and backward ($\theta_{lab} \geq 90$) hemispheres produced in the interactions of ^{32}S projectile with CNO, AgBr and Em are presented and analyzed. The experimental results have been compared with the data generated with the computer code FRITIOF based on Lund Monte Carlo Model. The dependence of $< N_F >$ and $< N_B >$ on N_h has been described by a linear linear relation in which the data is found to exhibit a positive correlation.

10.1 Introduction

Most of the experiments on high energy hadron-nucleus and nucleus-nucleus collisions [1–3] were carried out to study the characteristics of multiparticle production mainly for the forward emitted particles. During the last few decades, the production of backward particles at relativistic energies has received considerable experimental and theoretical attention [4, 5]. The primary reason for studying the emission of relativistic hadrons from nuclei in the backward direction is that, in free nucleon-nucleon collisions such production is kinematically restricted. Emission of relativistic hadron beyond this kinematic limit may then be evidence for exotic production mechanism, such as production from clusters [6]. Baldin et al. [7] argued that simple Fermi motion could not account for such backward hadron emission. They stated that the dominant mechanism for such production was an interaction between incident nucleons from the projectile and multinucleon clusters in the target; referred to as cumulative production. In this paper, we analyze the data on shower particle produced in both backward ($\theta_{lab} \geq 90$) and forward ($\theta_{lab} < 90$) hemispheres, where θ_{lab} is the emis-

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