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Title: **SOME CHARACTERISTICS OF THE COMPOUND MULTIPLICITY IN HIGH-ENERGY NUCLEUS–NUCLEUS INTERACTIONS**

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Abstract: The present paper deals with the interactions of ^{22}Ne and ^{28}Si nuclei at (4.1–4.5)A GeV/c with emulsion. Some characteristics of the compound multiplicity n_c given by the sum of the number of shower particles n_s and grey particles n_g have been investigated. The present experimental data are compared with the corresponding ones calculated according to modified cascade evaporation model (MCEM). The results reveal that the compound multiplicity distributions for these two reactions are consistent with the corresponding ones of MCEM data. It can also be seen that the peak of these distributions shifts towards a higher value of n_c with increasing projectile mass. It may further be seen that the compound multiplicity distributions becomes broader with increasing target size and its width increases with the size of the projectile nucleus. In addition, it has been found that the MCEM can describe the compound multiplicity characteristics of the different projectile, target and the correlation between different emitted particles. The values of average compound multiplicity increase with increasing mass of the projectile. Furthermore, it is observed that while the value of □n_c□ depends on the mass number of the projectile A_p and the target mass number A_t, the value of the ratio □n_c□/D(n_c) seems to be independent of A_p and A_t. The impact parameter is found to affect the shape of the compound multiplicity distribution. Finally, the dependence of the average compound multiplicity on the numbers of grey and black particles, and the sum of them, is obvious. The values of the slope have been found to be independent of the projectile nucleus.

Keywords: High-energy heavy ion reaction; nucleus–nucleus interactions; compound multiplicity; nuclear emulsion