

Interactions of Relativistic ${}^6\text{Li}$ Nuclei with Photoemulsion Nuclei

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Abstract—Inelastic interactions of nuclei accelerated to a momentum of $4.5\text{ GeV}/c$ per projectile nucleon with photoemulsion nuclei have been investigated. The main features of these interactions—mean ranges of ${}^6\text{Li}$ nuclei, mean multiplicities of secondaries, the isotopic composition of fragments, fragmentation channels, and the mean transverse momenta of projectile fragments—have been measured. The probability of the charge-exchange reaction featuring lithium nuclei has been determined. The results obtained for the ${}^6\text{Li}$ nucleus have been compared with data for other nuclei. The observed features of ${}^6\text{Li}$ interactions with other nuclei indicate that the ${}^6\text{Li}$ structure in the form of the loosely bound system consisting of an α -particle and a deuteron cluster clearly manifests itself in these interactions. Events resulting in the coherent dissociation of ${}^6\text{Li}$ nuclei into ${}^4\text{He} + d$, ${}^3\text{He} + t$, and $t+d+p$ and involving low-lying excitations of ${}^6\text{Li}$ have been observed.