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Secondary emission in pre-equilibrium reaction effects on differential cross-section

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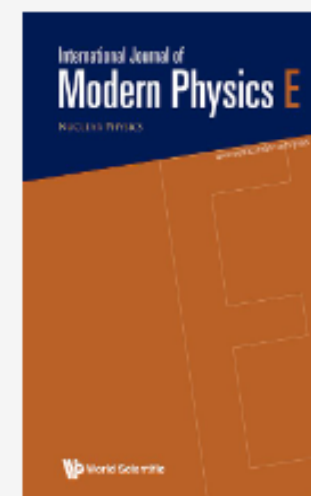
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Abstract

The differential cross-sections of the pre-equilibrium reactions were calculated within the exciton model (EM) and Feshbach–Kerman–Konin (FKK) theory for some selected reactions targets ($^{27}_{13}\text{Al}$, $^{56}_{29}\text{Co}$ and $^{209}_{83}\text{Bi}$) with (p, x) , (n, x) and (p, n) reactions at low and high energies 10, 14, 16, 25 and 57 MeV using PRECO-2006 to investigate the importance of secondary emission in the pre-equilibrium reactions. The results showed that the emission of secondary nucleons showed a behavior in the resulting spectra, the most prominent of which is its significant contribution to adding to the spectra obtained through practical experiments. As multistep direct (MSD) and multistep compound (MSC) are the main two components in the pre-equilibrium reaction, it was shown that the MSD dominated above 5 MeV emission energy rather than MSC reaction.

Keywords: Pre-equilibrium ■ PRECO-2006 ■ second emission ■ differential cross-section ■ FKK theory

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