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Investigation of the $\Lambda(1405)$ production in $p + p \rightarrow p + K^+ + \Lambda(1405)$ reaction

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Abstract

In this paper, the invariant mass spectra of $\Lambda(1405) \rightarrow (\Sigma\pi)^0$ in high energy proton-proton collisions in center of mass frame have been theoretically investigated. In pp collision the $\Lambda(1405)$ formation possibility has been taken into account and its decay rate to $(\Sigma\pi)^0$ channel, has been calculated with T-matrix elements and Green's function method. Finally, the results have been compared with the ANKE data for the first time, and using χ^2 method the confidence level diagrams have been obtained. The χ^2 fitting shows a good agreement between experimental data and the ones obtained in current paper.

Keywords: exotic nuclei, deeply bound kaonic nuclear states, $\Lambda(1405)$ state, ANKE data

For full article, refer to the Persian section