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Analysis of the production mechanism of $pK + \Lambda$ in $p + p$ collisions using partial wave analysis

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Collaboration

Abstract content

Baryonic resonances play a fundamental role in the understanding of nucleus-nucleus reactions at kinetic energies of few GeV. Using partial wave analysis (PWA) for investigation of exclusive reactions allows to take into account the interference between the intermediate resonant and non-resonant amplitudes that contribute to a certain final state. With this method the coherent production mechanism can be analyzed, that have been considered only be few analyses so far. The method was improved by developing a framework that allows for the simultaneous analysis of seven different data set collected with the COSY-TOF, HADES, DISTO and FOPI experiments for the reaction $p + p \rightarrow pK + \Lambda$ measured at kinetic energies varying from 2.14 to 3.5 GeV.
In this analysis the excitation function of the different contributing N^{*+}, in a mass range between 1650 MeV/c^2 and 1900 MeV/c^2, decaying into the $\Lambda^- K^+$ channel could be extracted for the first time. Furthermore a study of the the $p - \Lambda$ final state interaction could be carried out.
In this talk the analysis method and the results of a combined analysis are presented.

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