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# Low-energy $K^{-12}C \to \Lambda$ p R correlated production studies by AMADEUS

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## Collaboration

## Abstract content

The measurement of the $K^-$ multi-nucleon absorptions branching ratios and low-energy cross sections in both the $\Lambda$p and $\Sigma^0$p channels are performed by the AMADEUS collaboration, exploiting the low-momentum $K^-$ ($p_K \sim 127$ MeV/c) beam produced at the DA$\Phi$NE collider. The KLOE 2004-2005 data are analyzed by reconstructing the $\Lambda$p final state produced by the $K^-$ interactions with the inner wall of the KLOE drift chamber, which is an almost pure carbon target. Such measurements are fundamental to investigate the in-medium modification of the $K^-$ potential, which is attractive in-medium due to the partial restoration of chiral symmetry and whose behaviour in the KbarN subthreshold region is theoretically debated. Possible existence of Kbar-multinucleon bound state, whose properties are related to the controversial $\Lambda(1405)$ nature, is also experimentally debated. In kaon induced reaction the exotic state formation overlaps with the multi-absorption processes over a broad range of phase space rendering their measurements mandatory. In this work the yields of the $K^-$ two and three nucleon absorptions (2NA and 3NA) are measured with unprecedented accuracy. The signal emitted by the intermediate formation of the exotic $K^-$pp bound state, decaying through the $\Lambda$p channel, is also critically investigated.

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