

Investigation of the low-energy kaons hadronic interactions in light nuclei by AMADEUS

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Collaboration

Abstract content

The AMADEUS experiment deals with the investigation of the low-energy kaon-nuclei hadronic interaction at the DAΦNE collider at LNF-INFN, which is fundamental to solve longstanding questions in the non-perturbative strangeness QCD sector. AMADEUS step 0 consisted in the analysis of 2004/2005 KLOE data, exploiting K^- absorptions in H , ${}^4\text{He}$, ${}^9\text{Be}$ and ${}^{12}\text{C}$, leading to the first invariant mass spectroscopy study with in-flight negative kaons. With AMADEUS step 1 a dedicated pure Carbon target was implemented in the central region of the KLOE detector, providing a high statistic sample of pure at-rest K^- nuclear interaction. We will show the results obtained in the analysis of the $\Sigma^+\pi^-$ and $\Sigma^0\pi^0$ (pure isospin 0) channels, intended to shed light on the controversial nature of the $\Lambda(1405)$ state. The analysis of the $\Lambda(\Sigma^0)\pi^-$ channel, from which the measurement of the module of the isospin 1, S-wave non resonant transition amplitude can be extracted for the first time, will be presented. The investigation of single versus multi nucleon absorption in correlated Λp pairs production, and internal conversion processes will be shown, together with preliminary results on correlated Λd and Λt production.

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