

RECENT DEVELOPMENT IN THE ELECTROMAGNETIC PRODUCTION OF STRANGENESS ON NUCLEON AND NUCLEI

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Recent advancements in the accelerator and detector technologies have not only delivered experimental data on the cross section and polarization observables with unprecedented accuracies, but also left a number of problems yet unsolved. Among these problems the lack of mutual consistency between the new $p(\gamma, K^+)\Lambda$ SAPHIR [1] and CLAS [2] data is the meticulous one. It has been shown lately that the use of these data sets, individually or simultaneously, leads to quite different resonances parameters which, therefore, could lead to different conclusions on “missing resonances” [3]. In spite of this fact, there has been almost no attempt to reconcile the two data sets or to justify which data set should be used or excluded. In this talk we propose a method which could possibly help alleviate this problem. On the other hand, the $n(\gamma, K^+)\Sigma^-$ channel has been successfully measured by the LEPS collaboration [4], besides the conventional $p(\gamma, K^+)\Sigma^0$ and $p(\gamma, K^0)\Sigma^+$ channels. With the availability of experimental data on these three channels it is now possible to consider the $N(\gamma, K)\Sigma$ in an isospin framework, simultaneously. Future LNS data on $n(\gamma, K^0)\Sigma^0$ are therefore expected to complete this study [5].

The applications of the elementary operator that describes the elementary process $N(\gamma, K)Y$ are far-reaching. Investigation of the electromagnetic production of kaon on nuclei is a simple example. Kaon photoproduction on a deuteron is very important for studying the YN interaction. On ${}^3\text{He}$ kaon production can be used to investigate production of the hypertriton, the lightest hypernucleus. Photoproduction of the hypertriton, ${}^3\text{He}(\gamma, K^+)_{\Lambda}^3\text{H}$, can be utilized to investigate the hypertriton or ${}^3\text{He}$ wave functions, as well as to study the effects of Fermi motion and off-shell assumptions. In Fig. 1 we show sample of our results on the nucleon and ${}^3\text{He}$.

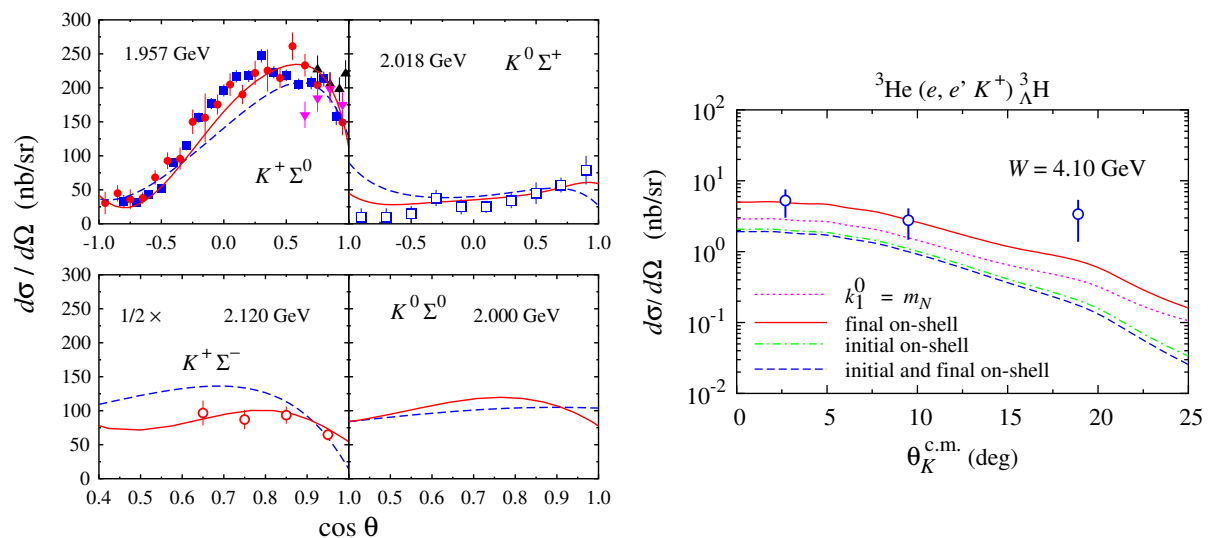


FIGURE 1: Results for kaon photoproduction on the nucleon (left) and on ${}^3\text{He}$ (right).

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