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High Energy Physics - Phenomenology

Normalization discrepancies in photoproduction reactions

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Recent CLAS photoproduction results using a tagged bremsstrahlung photon beam for the ground-state pseudoscalar meson photoproduction channels (\$K^+ \Lambda\$, \$K^+ \Sigma^0\$, \$\eta p\$, \$\pi^+ n\$ and \$\pi^0 p\$) show a normalization discrepancy with older results from SLAC, DESY and CEA that used an untagged bremsstrahlung beam. The CLAS results are roughly a factor of two smaller than the older data. The CLAS \$K^+\Lambda\$ and \$K^+\Sigma^0\$ results are in excellent agreement with the latest LEPS results that also employed a tagged beam. For the vector meson (\$\omega p\$ and \$\phi p\$) channels, CLAS agrees with SLAC results that employed a linearly polarized beam using laser back-scattering, as well as Daresbury data that also came from tagged photon experiment. We perform a global survey of these normalization issues and stress on their significant effect on the coupling constants used in various partial wave analyses.

Comments: This expands upon a talk given at NSTAR'11. It is also a

preliminary draft only

High Energy Physics - Phenomenology (hep-ph); Nuclear Subjects:

Experiment (nucl-ex); Nuclear Theory (nucl-th)

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