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Finite-Energy Sum Rules in Eta Photoproduction off a Nucleon
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— Pseudoscalar-meson photoproduction on the nucleon is of current interest for hadron reaction studies. At low energies it provides information about the nucleon spectrum, while at high energies it reveals details of the residual hadron interactions due to cross-channel particle (Reggeon) exchanges. These two regimes are analytically connected, a feature that can be used to relate properties of resonances in the direct channel to Reggeons in the cross channels. Even though photons couple to both isospin $I = 0, 1$ states, there are some notable differences between high energy photoproduction of the η ($I = 0$) and the π^0 ($I = 1$). These differences are ill understood. We have analyzed $\gamma N \to \eta N$ within a FESR framework. Using these sum rules, one is able to obtain the t-dependence of the high-energy Regge residues using low-energy models. The predictions from this approach were tested against the first GlueX results, confirming the our interpretation: a photon beam asymmetry close to $\Sigma = +1$ within the range $-t \approx 0.5 - 0.6$ GeV^2 indicate that the absence of a dip in eta photoproduction should be attributed to natural exchanges.

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