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Investigating $\eta\pi^-$ and $\eta'\pi^-$ Final States in the Double-Regge Region at COMPASS

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The COMPASS experiment at the CERN SPS provides a high-statistics dataset for studying the light-meson spectrum in various final states, including $\eta\pi^-$ and $\eta'\pi^-$, which are among the key channels to investigate the lightest hybrid-meson candidate, the $\pi_1(1600)$. A major challenge in extracting resonance parameters, such as pole positions, is the separation of resonant and non-resonant contributions.

To better constrain the non-resonant production mechanism in these channels, we analyze the high-mass region ($2.4 \text{ GeV}/c^2 < m_{\eta^{(\prime)}\pi^-} < 6 \text{ GeV}/c^2$) using the double-Regge exchange model developed by the JPAC collaboration. By performing an event-based likelihood fit to the full COMPASS dataset, we test and extend the model to higher invariant masses. We find that, by including form factors to account for the correct t -dependence at the top and bottom vertices, the data can be well described with only 13 free parameters. The relative strengths of the contributing amplitudes in both final states will be presented.

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