

Pomeron-Quark Coupling from Charge Conjugation Invariance

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Abstract: Based on the charge conjugation invariance and the vacuum property of the Pomeron, we point out that the commonly used vector vertex of the Pomeron coupling to quark is incorrect since it contradicts with the Pomeron property. We also claim that the soft Pomeron could be a tensor glueball $\xi(2230)$ with quantum numbers $I^{GJPC}=0^{+2^{++}}$ and total decay width $\Gamma_{\text{tot}} \approx 100$ MeV, which lies on the soft Pomeron trajectory $\alpha_p = 1.08 + 0.20t$. Therefore, the coupling vertex of the soft Pomeron to quark should be tensorial which is invariant under the charge conjugation and can explain why the inadequate vector coupling, γ^μ , of the soft Pomeron to quark is successful in dealing with Pomeron physics.

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Key words: Pomeron, quark, tensor glueball, Pomeron-quark, coupling vertex

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