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Sub-GeV leptophobic B-boson exchange in $\phi \rightarrow \pi^0 \eta \gamma$ decays

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The sensitivity of the rare decay process $\phi \rightarrow \pi^0 \eta \gamma$ to signatures of a leptophobic boson in the MeV-GeV mass range is analyzed in this talk. First, we improve the description of the dominant scalar contribution. Next, we incorporate an explicit B-boson resonance exchange alongside the Standard Model (SM) contributions from vector and scalar meson exchanges. By utilizing experimental data related to the associated branching ratios and invariant mass spectra, we are able to improve the current constraints on the B-boson mass, m_B , and its coupling to SM particles, α_B . However, the decays $\phi \rightarrow \pi^0 \eta \gamma$ provide weaker constraints on the B-boson parameters compared to $\eta \rightarrow \pi^0 \gamma \gamma$ below the mass of the η meson.

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