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Connecting LHCb flavor anomalies to astrophysics observations

Wan-Zhe Feng
Northeastern University, USA

The LHCb collaboration has reported deviations from the standard model (SM) in $b \to s^{`+`-}$ decays. These can be explained within $U(1)^0$ gauge extensions of the SM, in which the corresponding Z^0 gauge boson can mediate $b \to s^{`+`-}$ transitions at tree level. In these models SM fermions carry family-dependent $U(1)^0$ charges in order to generate the required flavor changing Z^0 to quarks and lepton non-universality. We showed that such models can also accommodate a dark sector and the dark matter candidates can annihilate efficiently to produce the observed relic density. A big class of models to explain the flavor anomalies contains hypothetical particle leptoquarks. We correlate such models to the s-channel enhancement of neutrino-quark scattering in the very high energy shower events observed by the IceCube collaboration.

Biography

Wan-Zhe Feng has completed his PhD from Northeastern University and Post-doctoral studies from Hong Kong University of Science and Technology and Max-Planck-institute for Physics at Munich.

vicf@mpp.mpg.de

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