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SU(4) weak singlet leptoquark in R_K flavor anomaly

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We present a detailed study of a proposed model to explain the experimental hints of new physics in B meson decays within the framework of the Pati-Salam unification. The model is based on the local gauge group $SU(4)_L \otimes SU(4)_R \otimes SU(2)_L \otimes U(1)'$ and part of its gauge bosons are $(3,1)_{2/3}$ vector leptoquarks. The key feature of the model is that $SU(4)_R$ is broken at a high energy scale, which suppresses right-handed lepton flavor changing currents at the low energy scale. The constraints imposed on the model by independent measurements show that the mass of the leptoquark can be as low as 10 TeV, not requiring the introduction of quarks or leptons mixings with new vector-like fermions. We obtain constraints from various pseudo-observables for the leptoquark couplings and contrast them against a model-independent analysis.

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