

# $U(1)_Q$ invariance and $SU(3)_C \times SU(3)_L \times (U(1))_X$ models with $\beta$ arbitrary

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Abstract: Using  $U(1)_Q$  invariance, the photon eigenstate and the matching gauge coupling constants in  $SU(3)_C \times SU(3)_L \times (U(1))_X$  models with arbitrary  $\beta$  are given. The mass matrix of the neutral gauge bosons is exactly diagonalized, and the photon eigenstate is independent on the symmetry breaking parameters - the VEVs of the Higgs scalars. By obtaining the electromagnetic vertex, the model is embedded naturally into the standard model. © Springer-Verlag/Società Italiana di Fisica 2005.

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