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VMD/HLS Approach to the muon (g-2) : A solution to the tau-e+e- puzzle

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Content

The Hidden Local Symmetry (HLS) Model provides a framework able to encompass several physical processes and give a unfied description of these in an energy range extending up to the ϕ mass. However, in order to account precisely for experimental data, it should be supplied with several symmetry breaking schemes. Among these, an energy dependent mixing mechanism of the vector mesons ($\rho^0 - \omega - \phi$) is generated via loop effects and allows to define an effective broken HLS (BHLS) model. Within this framework the e^+e^- annihilations to $\pi^+\pi^-$, $\pi^0\gamma$, $\eta\gamma$, $\pi^+\pi^-\pi^0$, K^+K^-, K_LK_S and the dipion spectrum in the decay $\tau^\pm \to \pi^\pm\pi^0\nu$ are *simultaneously* accounted for with the same set of model parameters. These are derived from global fits in procedures involving all existing data samples covering the channels within the BHLS scope. The muon HVP's derived from fits performed with and without the τ dipion spectra are found consistent with each other. Therefore, within the broken HLS approach, one does not observe any clear mismatch between the τ and e^+e^- physics properties.

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