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Neutrino masses and mixings

Experiment: theory

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Systematics of quark-antiquark states and scalar exotic mesons

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Abstract

The results of a recent analysis of the Crystal Barrel data on the $p\bar{p}$ annihilation in flight are presented. The analysis allowed us to determine a considerable number of meson states over the range 1900–2400 MeV, that makes it possible to carry out the systematics of quark-antiquark states on the (n, M^2) and (J, M^2) planes (n is radial quantum number of the $q\bar{q}$ state with mass M and J is its spin. The data favour nearly linear trajectories in the (n, M^2) and (J, M^2) planes. More detailed examination is done for the scalar meson sector, where on the basis of partial width analysis it became possible to perform the nonet classification of scalar mesons. The scenario is discussed with two fixed nonets below 1900 MeV. Then in the scalar sector there exist two states with isotopic spin $I = 0$, which are extra ones for the $q\bar{q}$ classification, namely, the broad resonance $f_0(1200 - 1600)$ and the light sigma-meson $f_0(450)$.

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