Abstract Submitted
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On the origin of the narrow peak and the isospin symmetry breaking of X(3872)[1] SACHIKO TAKEUCHI, Japan College of Social Work, KIYOTAKA SHIMIZU, Department of Physics, Sophia University, MAKOTO TAKIZAWA, Showa Pharmaceutical University — The $X(3872)$ is investigated by a $c\bar{c}$-two-meson hybrid model. The two-meson state consists of the $D^0\bar{D}^{*0}$, D^+D^{*-}, $J/\psi\rho$, and $J/\psi\omega$. The energy dependent decay widths of the ρ and ω mesons are taken into account. With reasonable assumptions we found that the $X(3872)$ can be a shallowly bound state or a low-energy resonance. In either case, it is found that very narrow $J/\psi\rho$ and $J/\psi\omega$ peaks appear around the $D^0\bar{D}^{*0}$ threshold in the B meson decay. Also, the isospin symmetry breaking of large size is found in the $X(3872)$ decay; the strength of the $J/\psi\omega$ peak is only 2.66 times as large as that of the $J/\psi\rho$. The isospin symmetry breaking in the present model comes from the difference in the meson masses and widths. The size of the breaking in the decay becomes larger as the $c\bar{c}$-$D\bar{D}^*$ coupling becomes weaker. The relative strength of the $D^0\bar{D}^{*0}$ below the D^+D^{*-} threshold also varies largely according to the size of this coupling. It is also found that the branching ratio of the $D^0\bar{D}^{*0}$ and the $J/\psi\rho$, which is still controversial experimentally, is a good indicator whether the $X(3872)$ peak is a bound state or a threshold effect.

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