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On decays of $X(3872)$ to $\chi_{cJ}\pi^0$ and $J/\psi\pi^+\pi^-$

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By describing the $X(3872)$ using the extended Friedrichs scheme, in which $D\bar{D}^*$ is the dominant component, we calculate the decay rates of the $X(3872)$ to π^0 and a P -wave charmonium χ_{cJ} state with $J = 0, 1$, or 2 , and its decays to $J/\psi\pi^+\pi^-$ where $\pi^+\pi^-$ are assumed to be produced via an intermediate ρ state. The decay widths of $X(3872) \rightarrow \chi_{cJ}\pi^0$ for $J = 0, 1, 2$ are of the same order. However, this model calculation exhibits that the decay rate of $X(3872)$ to $\chi_{c1}\pi^0$ is one order of magnitude smaller than its decay rate to $J/\psi\pi^+\pi^-$.

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