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The role of form factors in a model for the $J/\psi \rightarrow \pi \pi \pi$ decay.

The so called rho-pi puzzle has defied every theoretical approach, and it consists in understanding why higher-mass intermediate states are suppressed in favor of rho-pi dynamics. The study of known decays of the pi meson can shed light in solving this puzzle. In several sources it has been introduced the use of a form factor for the meson meson meson vertices due to the internal quark-gluon structure of the hadrons, and it is known that form factors play an important role in physical phenomena such as pion-pion scattering. It is also common to use a form factor for the s-channel monopole.

In this work we study the impact of form factors in the $J/\psi \rightarrow \pi \pi \pi$ branching ratio, considering form factors for both monopole and meson meson meson (mmm) vertex. We propose a model for the description of the J/ψ -V-P vertex inspired in resonance chiral theory, assuming it can be applied in the representation of the V-P-P vertex. For our model, an unknown coupling constant needs to be determined. This decay has been already studied in the literature, so comparison can be done between our work and those models.

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