

Theoretical studies of $e^+e^- \rightarrow K^+K^-\gamma$ reaction

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Collaboration

Abstract content

The $e^+e^- \rightarrow K^+K^-\gamma$ reaction is studied for the e^+e^- energies close to the mass of the $\phi(1020)$ meson. Different mechanisms leading to the final state are considered. The strong interaction amplitudes of the K^+K^- pairs in the S-wave are taken into account. Photon emission in the initial state, the final state radiation effects as well as all possible interference terms are included in the transition matrix elements. The K^+K^- effective mass distributions and the angular dependence of the reaction cross-section are calculated. The results of theoretical calculations can be used in future experimental measurement of the unknown branching fraction of the $\phi(1020)$ meson into the $K^+K^-\gamma$ channel. They can also serve in determination of the K^+K^- threshold parameters of the strong interaction amplitudes and in a better specification of the properties of the scalar meson resonances $f_0(980)$ and $a_0(980)$.

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