

Photoproduction of tensor mesons

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Collaboration

Abstract content

Assuming that the $f_2(1270)$, $f_2(1525)$, $a_2(1320)$, and $K_2^*(1430)$ resonances are dynamically generated states from vector-meson–vector-meson interactions in the s -wave with spin $S = 2$, we study the $\gamma p \rightarrow f_2(1270)p$, $f_2(1525)p$, $a_2^0(1320)p$, and $\gamma p \rightarrow K_2^*(1430)\Lambda(\Sigma)$ reactions. These reactions proceed in the following way: the incoming photon first mutates into a ρ^0 , ω , or ϕ meson via vector-meson dominance, which then interacts with the ρ^0 , ω , or K^* emitted by the incoming proton to form the tensor mesons $f_2(1270)$, $f_2(1525)$, $a_2(1320)$, and $K_2^*(1430)$. The picture is simple and has no free parameters, as all the parameters of the mechanism have been fixed in previous studies. We predict the differential and total cross sections of these reactions. The results can be tested in future experiments and therefore offer new clues about the nature of these tensor states.

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