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## Coupled channel model of the scalar isovector meson photoproduction

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Electromagnetic processes are known to be a good source of information on the meson inner structure. Analysis of these processes turned out to be particularly fruitful in case of scalar mesons which emerge eg. in the  $\phi(1020)$  radiative decays in both  $\pi\pi$  and  $\pi\eta$  channels.

Photoproduction of isoscalar and isovector scalar resonances can be treated as a complementary source of information on the scalar meson

structure. Here we are concerned with the photoproduction of isovector scalars, ie.  $a_0(980)$  and  $a_0(1450)$ . Moreover, we are interested in photoproduction at photon energies of about 10 GeV, ie. energies achievable in new JLab experiments CLAS12 and GlueX. In this kinematic region the process is dominated by the t channel meson exchange which leads to production of pseudoscalar pairs  $\pi\eta$ ,  $K\bar{K}$  and  $\pi\eta'$ . These in turn can resonantly interact in the final state. So, construction of the photoproduction amplitudes is inevitably the coupled channel problem.

In ref. [1] we constructed the  $\pi\eta-K\bar{K}$  coupled channel photoproduction amplitudes where  $a_0(980)$  and  $a_0(1450)$  resonances emerged due to final

state interactions. Here we present the extended version of the model which takes into account also the  $\pi\eta'$  channel. The model is also applicable to higher partial waves (see [2]) and is relevant in the context of CLAS12 and GlueX experiments to be started shortly at Jefferson Laboratory, USA. In these experiments the  $\pi\eta$ ,  $K\bar{K}$  and  $\pi\eta'$  pairs will be photoproduced copiously (also by polarized photons) enabling the partial wave analysis. Reliable models of the resonance photoproduction a thus timely and opportune.

Literature:

1. L. Bibrzycki, R. Kaminski, <https://arxiv.org/abs/1509.06135>
2. L. Bibrzycki, R. Kaminski, Phys.Rev. D87, no.11, 114010 (2013)

### Summary

We present the coupled channel model of the scalar isovector resonance photoproduction where  $\pi\pi$ ,  $K\bar{K}$  and  $\pi\eta'$  channels are taken into account..

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