

# International Workshop on Partial Wave Analyses and Advanced Tools for Hadron Spectroscopy



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## Dipion resonance photoproduction on nucleons

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The t-channel reggeon exchange is the dominant mechanism of the high energy photoproduction of di-meson resonances on nucleons. The resulting amplitude naturally factorizes into initial production of meson pairs and subsequent final state interaction, which can be described in terms of binary amplitudes satisfying the constraints of unitarity and analyticity. However, for the final states consisting of 3 bodies as is the case here, the overall high energy of the system does not preclude that the 2-particle meson-nucleon subsystem is in fact low energetic and instead of using the Regge approach it should be described in terms low energy (baryon) resonance dynamics. This applies in particular to resonances observed in the photoproduced  $\pi+\pi$ -system. To fully describe such a system we have created the model which incorporates both the low energy meson-baryon dynamics, parametrized in terms of SAID elastic  $\pi$ -N amplitudes [1] (up to  $\pi$ -N effective mass of 2 GeV) and high energy regime parametrized in terms of reggeon exchanges [2] (above that limit). We use this approach to describe the two pion photoproduction in the D-wave, with particular emphasis put on the emergence of tensor-isoscalar resonances. The  $\pi$ - $\pi$  rescattering is described in terms of unitary amplitudes satisfying once subtracted dispersion relations and with crossing symmetry properly imposed. Based on that, we calculate the photoproduction cross sections and mass distributions with clearly identifiable signals of isoscalar tensor meson production.

### Literature:

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2. Ł. Bibrzycki, R. Kamiński, Phys.Rev. D87, 114010 (2013)
3. P. Bydžovský, R. Kamiński, V. Nazari, Phys.Rev. D94, 116013 (2016)

**Primary authors:** Dr BIBRZYCKI, Lukasz (Pedagogical University of Cracow); ROBERT, Kaminski (Institute of Nuclear Physics PAN)

**Presenter:** Dr BIBRZYCKI, Lukasz (Pedagogical University of Cracow)

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