

Determining dominant partial waves in photoproduction

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Important contributions to the study of the excitation spectra of baryons are provided by measurements of polarization observables in reactions that involve particles with spin. Pseudoscalar meson photoproduction poses an example-reaction that has been under intense investigation recently.

The extraction of resonance-parameters from the polarization-data in so-called energy-dependent fits, often involving sophisticated reaction-theories and analyzing several reaction-channels at once, represents the state-of-the-art method to get to the spectrum. While yielding important scientific insights, the construction and handling of such models is very sophisticated.

The analysis of partial waves at single energies in so-called energy-independent fits represents a simpler problem. However, due to mathematical ambiguities rising exponentially in number with the amount of non-zero partial waves, such analyses still require some experience. In order to obtain first insights into a newly measured polarization dataset, simpler alternatives are desirable.

This talk will present the very basic method of moment-analysis for pseudoscalar meson photoproduction, which proceeds by analyzing just the angular distributions. The order of the dominant partial waves contributing in the data can be extracted quickly using this method. Furthermore, the coefficients extracted from the angular distributions show interesting composition-patterns in terms of multipoles and allow for instructive comparisons to models. A survey of recently published polarization data will be given using this method.

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Authors: WUNDERLICH, Yannick (University of Bonn); AFZAL, F.; THIEL, A.; BECK, R.

Presenter: WUNDERLICH, Yannick (University of Bonn)

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