

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



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On proton deformation: A model independent extraction of EMR from recent photoproduction data.

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The most recent $\gamma p \rightarrow p\pi^0$ [1,2,3] and $\gamma p \rightarrow n\pi^+$ data have been used for multipole amplitude extraction at the $\Delta^+(1232)$ resonance.

The data have been analysed in a novel way, utilizing the Athens Model Independent Analysis Scheme (AMIAS),

yielding precise results with little, if any, model error. The benchmark quantity in nucleon deformation,

$EMR = E1 +^{3/2} / M1 +^{3/2}$, was determined to be: $-(2.5_{-0.2}^{+0.3} stat)\%$ and

$-(2.5_{-0.3}^{+0.4} stat + syst)\%$,

consistent with previous results but for the first time free of model error.

Non resonant amplitudes up to $L = 5$ have also been extracted which test the sophisticated phenomenological model used in nucleon resonance research.

The elaborate analysis scheme and its comparison to the traditional methods will be presented at the conference.

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