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Recent developments in meson production analyses within a dynamical coupled-channels approach of Jülich-Athens-Washington model[1]
KANZO NAKAYAMA, Department of Physics and Astronomy, University of Georgia, Athens, GA 30602 — The recent developments in the excited-baryon-analysis program by the Jülich-Athens/GA-Washington/DC Collaboration will be presented. The program's analysis is based on a dynamical coupled-channels approach developed by the Collaboration [1,2], where the basic symmetries, such as the two-body unitarity, analyticity, and gauge invariance are respected. In the hadronic reactions sector, the πN, ηN, $K\Lambda$, and $K\Sigma$ channels are included, in addition to the effective $\pi\pi N$ channels σN, ρN, and $\pi\Delta$. Energies up to $\sqrt{s} = 2.2$ GeV are considered in the newest version. In the photon-induced reactions sector, the neutral and charged pion photoproduction processes are considered so far [2]. These are currently being extended to higher energies including the ηN, $K\Lambda$, and $K\Sigma$ channels. Here, in particular, gauge invariance is enforced as dictated by the generalized Ward-Takahashi identity.

[1] D. Rönchen *et al.*, Eur. Phys. J. A **49**, 44 (2013).
[2] F. Huang *et al.*, Phys. Rev. C **85**, 054003 (2012).

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Kanzo Nakayama
Department of Physics and Astronomy,
University of Georgia, Athens, GA 30602

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