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First results from freed-isobar analysis with extended wave-sets

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The COMPASS experiment has collected a very large data set of 50 million diffractively produced $\pi^-\pi^+\pi^-$ events using a 190 GeV/c negatively charged hadron beam. In addition to the results of an extensive Partial-Wave Analysis (PWA) of this data, we recently published first results of a so-called freed-isobar PWA. In this approach, fixed parametrizations of intermediate $\pi^+\pi^-$ resonances are replaced by piecewise constant functions, which leads to a less biased extraction of two- and three-particle amplitudes. The success of this first analysis, which was limited to 3 partial waves with $J^{PC} = 0^{++}$ of the two-pion subsystem, led to an extension of the method to include also waves with $J^{PC} = 1^{--}$ and 2^{++} two-pion subsystems. First results from Monte Carlo studies will be presented. We will also discuss the ambiguities that arise in these extended free-isobar PWAs and will show how to resolve them.

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