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Publication

Accurate Test of Chiral Dynamics in the (gamma)over-right-arrowp -< pi(0) p Reaction

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 2360235
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Year 2013
Title Accurate Test of Chiral Dynamics in the (gamma)over-right-arrowp -< pi(0) p Reaction
Journal Physical review letters
Volume 111
Number 6
Pages / **Article-Number** 062004
A precision measurement of the differential cross sections d sigma/d Omega and the linearly polarized photon asymmetry Sigma equivalent to (d alpha(perpendicular to) - d sigma(parallel to))/(d alpha(perpendicular to) + d sigma(parallel to) for the (gamma) over right arrowp ->pi(0) p reaction in the near-threshold region has been performed with a tagged photon beam and almost 4 pi detector at the Mainz Microtron. The Glasgow-Mainz photon tagging facility along with the Crystal Ball/TAPS multiphoton detector system and a cryogenic liquid hydrogen target were used. These data allowed for a precise determination of the energy dependence of the real parts of the S- and all three P-wave amplitudes for the first time and provide the most stringent test to date of the predictions of chiral perturbation theory and its energy region of agreement with experiment.

Publisher American Physical Society
ISSN/ISBN 0031-9007
edoc-URL http://edoc.unibas.ch/dok/A6223418
Full Text on edoc No;
Digital Object Identifier DOI 10.1103/PhysRevLett.111.062004
ISI-Number WOS:000322811400009
Document type (ISI) Article