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Partial Wave Analyses of antiproton-proton annihilations in flight

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To investigate important aspects for the upcoming PANDA experiment, partial wave analyses (PWA) of antiproton-proton annihilation processes are carried out using data from the Crystal Barrel (LEAR) experiment. A coupled channel analysis of the three reactions resulting in the final states K+K-π0, π0π0η and π0ηη at a beam momentum of 900 MeV/c is currently in progress. Preliminary results on the determination of resonance contributions and of the spin density matrix (SDM) of different light mesons are presented. The elements of the SDM provide important information about the production process. Furthermore, results of analyses of the ω meson in different channels are discussed. These studies are focused on the determination of the contributing angular momenta of the antiproton-proton system as well as of the SDM of the ω. Significant spin-alignment effects depending on the production angle are visible here. All analyses have been performed using PAWIAN, a common, object-oriented and easy-to-use PWA software that is being developed at the Ruhr-Universität Bochum. This presentation summarizes recent activities of the Crystal Barrel (LEAR) Collaboration. This work is supported by the BMBF.

Primary author: PYCHY, Julian (Ruhr-Universität Bochum(RUB))

Co-authors: Dr KOPF, Bertram (Ruhr-Universitaet Bochum); Prof. KOCH, Helmut (Ruhr-Universität Bochum); Prof. WIEDNER, Ulrich (Ruhr-Universität Bochum)

Presenter: PYCHY, Julian (Ruhr-Universität Bochum(RUB))

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