Near-threshold pion production in diproton reactions with polarized beams and target at ANKE-COSY

S. Dymov[(a),(b)] for the ANKE collaboration

[(a)] Universität Erlangen-Nürnberg, Erlangen, Germany
[(b)] JINR, Dubna, Russia

An extensive experimental program for the near-threshold pion production in diproton reactions is undertaken at the ANKE-COSY spectrometer (Jülich). The program is aiming at isolating of the four-nucleon-pion contact interaction term appearing in the χPT expansions of these processes. This will establish links between the pion production and other low energy phenomena within the χPT approach.

The first step in the program was to measure the differential cross-section and the vector analysing power in the $pp \to \{pp\}_s\pi^0$ and $pn \to \{pp\}_s\pi^-$ processes in the full angular range. These data allowed for partial wave analysis applying Watson's theorem. To make the analysis more robust and independent of the uncertainties of the relative normalization, the spin correlation coefficients $A_{x,x}$ and $A_{y,y}$ in the $pn \to \{pp\}_s\pi^-$ process were measured in a follow-up experiment. The first results of the data analysis will be presented and the further development of the program discussed.

This work is supported by the COSY-FFE program.

E-mail: s.dymov@fz-juelich.de