

# Study of coherent pion production in proton-deuteron collisions with polarized beams and target at ANKE-COSY

Friday, 3 June 2016 17:40 (0:20)

## Collaboration

ANKE

## Abstract content

Two-body pion production in the interaction of protons with few-nucleon systems is of interest, both from the point of view of studying the reaction mechanism, and from that of determining the structure of light nuclei. The success of microscopic models with explicit  $\Delta$ -excitation for two-nucleon systems suggests that these models should be tested in the three-nucleon case, where production of  $\Delta$  is intimately linked to 3N forces.

In general six invariant amplitudes are required to describe the  $pd \rightarrow {}^3He\pi^0$  reaction, but this number reduce to two at threshold or in the forward/backward directions [2].

The  $pd \rightarrow {}^3He\pi^0$  and  $pd \rightarrow {}^3He\pi^+$  reactions have been studied experimentally over many decades and a wealth of data on the differential cross sections and analysing powers has been collected for these processes. However, the double polarisation observables have been explored far less and information on the spin correlations is still very scarce. The ANKE spectrometer equipped with an internal polarised target together with the polarised deuteron beam of COSY provided a unique opportunity to conduct measurements of the transverse spin correlation coefficients in these reactions. These results, obtained at 363 and 600 MeV per nucleon, can be used together with the existing data on the differential cross section and the tensor analysing power  $T_{20}$  [2] to extract information on the forward spin amplitudes.

This work is supported by the COSY-FFE program.

[1] J.-F. Germond and C. Wilkin, J. Phys. G 16 (1990) 381

[2] C. Kerboul et al., Phys. Lett. B 181 (1986) 28

**Primary author(s) :** DYMOV, Sergey (FZ Juelich)

**Co-author(s) :** SHMAKOVA, Vera (JINR)

**Presenter(s) :** DYMOV, Sergey (FZ Juelich)

**Session Classification :** Parallel Session B4