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Preparation for the Time Reversal Invariance experiment at COSY (TRIC)

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The Universe around us consist mainly of matter although it is assumed that in the Big Bang an equal amount of antimatter has been produced. The Standard Model prediction for the proportion for the number of the baryons and antibaryons differs from the Astrophysical observations by eight orders of magnitude. To explain this phenomenon, which is usually called the Baryon Asymmetry of the Universe (BAU), a strong CP or T-violation must be found. A possible discovery of a T-symmetry violation in a system of baryons would be a strong indication for the existence of the physics beyond the Standard Model.
Using a polarized proton beam of the Cooler-Synchrotron COSY-Jülich and tensor polarized deuterium target, located at the internal PAX target place, we have access to the unique genuine T-odd P-even null observable Ay,xz. It will be determined in the transmission experiment where the total cross section of the double polarized pd scattering will be determined from the difference in beam current slopes for two beam-target spin configurations. Hence, in addition, to the polarized beam and target, a dedicated high precision beam current measurement system is under the preparation for the TRIC experiment.
During an experiment in June 2016 a polarized proton beam of COSY, a deuterium target at PAX, and a high precision beam current measurement system were commissioned. In addition, during this beam time the first measurement of the AY,Y observables in pd scattering at 135 MeV has be obtained using the TRIC method. In this contribution an overview of activities towards realization of the TRIC experiment as well as preliminary results from the test beam time will be presented.

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