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Absolute measurement of the differential cross section for pp elastic scattering at ANKE-COSY

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Very little is known experimentally on proton-proton elastic scattering in the energy range from 1.6 to 2.8 GeV for centre-of-mass angles between about 10 and 30 degrees. The differential cross section data that do exist seem to fall systematically below the predictions of the SAID data analysis program. Measurements in this kinematical region are possible at the ANKE spectrometer, which is situated inside the COSY-Jülich storage ring. The fast proton that is scattered at small angles is registered in the Forward Detection system and the slow recoil proton emerging at large angles is measured in one of the Silicon Tracking Telescopes.

The ANKE collaboration and the COSY machine crew have jointly developed a very accurate method for determining the absolute luminosity in an experiment at an internal target position. The technique relies on measuring the energy losses due to the electromagnetic interactions of the beam as it passes repeatedly through the target and this can be done by studying the Schottky spectrum. This powerful technique allows one to measure the absolute differential cross section for elastic pp scattering with high precision.

Preliminary results from this experiments will be presented.

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