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Calibration of backward ball scintillators of the BINA detection system

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BINA is an experimental setup with a nearly 4π geometrical acceptance that has been developed in 2004 at KVI and designed for studying three- and four-nucleon scattering processes. BINA is composed of two main parts, a forward wall and the backward ball. The forward wall consists of two components, namely a hodoscope of segmented thin and thick scintillators and a Multi Wire Proportional Chamber (MWPC). The scintillators are used for the particle identification and for the energy measurement of scattered protons and deuterons (ΔE-E). The MWPC is used to obtain the scattering angles of these particles. The forward part of BINA has been designed to detect particles at scattering angles between 10◦ to 35◦. The backward ball consists of 149 fast and slow scintillators for a ΔE-E measurement. The backward part covers polar angles between 35◦ to 165◦ with nearly full azimuthal coverage. Our aim is to measure differential cross sections of the p-d elastic reaction at 135 MeV and at large scattering angles., For this, we are developing a calibrating procedure for the ball detectors of BINA based on a kinematical approach and by making use of GEANT3 simulations. In this contribution, we will present the preliminary results of the ball calibration.

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