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Energy calibration for the forward detector at WASA-at-COSY

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Abstract content

One of the main aspects of the WASA-at-COSY physics program are studies on rare and forbidden decays of light mesons. In this context a large data set of η mesons has been produced in proton proton scattering in order to investigate the decay properties of this meson. This high statistic measurement allows, e.g., for the search for the C parity violating reaction $\eta \rightarrow \pi^0 + e^+ + e^-$, for which only an upper limit for the branching ratio could be measured so far. The analysis of this forbidden decay channel relies on an effective separation of the physical background which is mainly caused by the direct π production. To handle this background a missing mass analysis and kinematic fitting will be applied. Since both methods rely on a high energy resolution the forward detector, which measures the proton energies, has to be calibrated very carefully. In this contribution, a new calibration software is presented which has been developed especially for proton-proton measurements, and which allows for a precise determination of the calibration parameters by the mean of a graphical user interface and a dedicated fitting algorithm.
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