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Exploring the HADES Feb22 pp Run

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During this spring the HADES experiment at GSI in Darmstadt, Germany had a total of 30 days of proton beam, producing pp reactions at 4.5 GeV beam kinetic energy. The main goal of this beam time is to study hyperon production and their electromagnetic decays. It is one of the FAIR Phase-0 projects, using FAIR equipment at the GSI facility. For this run the HADES spectrometer was accomplished by a Forward Detector which includes PANDA Straw Tube Tracking Stations.
While the detector calibration is ongoing, the simplest physics channel to look into is proton-proton elastic scattering. One can learn a lot about data quality by studying this channel including a luminosity measurement, quality control and normalization. Since the Forward Detector was added, three event topologies can be studied. While one proton is detected in the main HADES spectrometer, the other one can either be found in the same detector, or in the Forward Detector, or completely escape detection. Our measurements are compared to detailed differential cross-section measurements from other experiments at 4.15 GeV and 4.65 GeV, available by the database SAID. Apart from providing crucial input for the HADES physics program foreseen for this data campaign, these studies will contribute with new pp elastic cross-section measurements at intermediate energy.

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