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pp Scattering from Standard to the Unknown with PANDA@HADES

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One of the most challenging questions about the smallest constituents of visible matter is how hadrons are built from quarks. This means we do not yet understand the structure of one of the most abundant particles of our world, the nucleon. But what if we change the nucleon a little bit? Would that extend our picture? Hyperons are similar to nucleons but contain one or several strange quarks. By studying the decays of the unstable hyperons, we can gather valuable information about their inner structure. This inner structure is quantified by electromagnetic form factors. Especially by studying hyperon Dalitz decays, where a hyperon decays into a lighter hyperon and a virtual photon that produces an electron-positron pair, basic particle quantities as magnetic dipole moments become accessible. The FAIR Phase-0 project PANDA@HADES with this spring's beam time dedicated to hyperons enables such studies. In this framework the HADES spectrometer was complemented by the PANDA forward tracking system and the forward Resistant Plate Chambers which extend the acceptance for protons in the forward direction. pp elastic scattering with known cross section is used for commissioning of the new detectors as well as for an absolute luminosity measurement. I will present the application of pp elastic scattering for luminosity monitoring purposes as well as first efforts of measuring the Σ^0 Dalitz decay in the experiment recently performed.

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