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Exploiting di-muon production at PANDA

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The physics program of the future PANDA experiment includes the investigation of the non-perturbative region of the QCD by mean of antiproton beams, eventually polarised, with a beam momentum up to 15 GeV/c. Part of the PANDA spectrometer is devoted to the muon identification, that allow to access many among those processes needed to probe the nucleonic structure. The high foreseen luminosity should allow to investigate the Drell-Yan (DY) production of muon pairs. This reaction is a unique tool to access the spin depending properties of the nucleon, and in particular its transverse degrees of freedom, by means of experimental asymmetries leading to the Transverse Momentum Dependent Parton Distribution Functions (TMD PDF's). Moreover, a scan across the J/ψ mass region should allow a measurement of the phase between the strong and the electromagnetic amplitudes of the J/ψ decay. The investigations on the azimuthal asymmetries, and on the J/ψ scan expected in the PANDA scenario will be discussed in detail.

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