Contribution ID: **55** Type: **Oral report**

Short range correlations investigated by DSS collaboration in deuteron involved reactions

Monday 20 September 2021 13:35 (25 minutes)

Investigation of the reactions of deuteron elastic scattering and deuteron breakup are interesting from the point of view of nucleon-nucleon (NN) and three nucleon (3N) correlations, special attention is paid to short distances with high transferred momenta. The Deuteron Spin Structure (DSS) collaboration revealed a strong sensitivity to the spin structure of short-range isoscalar NN correlations, this has been observed for elastic dp scattering in deuteron analyzing powers. Spin structure of np short-range correlations was found earlier in the inclusive reaction of Ayy's tensor analyzing power at JINR synchrophasotron. The analysis was performed at different energies in wide areas of fraction of longitudinal xF and the transverse momenta pT of proton. Ayy demonstrates dependence on at least these two internal variables, but the approach used could not describe the data. Effective cross section and analyzing powers of the elastic dp process are obtained and partially processed in the energy range 200 - 2000 MeV. The most interesting energy region we plan to pass through with a step of only 50 MeV. The results are compared with a relativistic model of multiple scattering. The deuteron breakup reaction in the region of hundreds of MeV have rich phase space, by scanning, angular and energetic we can learn more about short-range correlations of nucleons or e.g. on non - nucleonic degrees of freedom depending on the selected part of the phase space. A large influence of relativistic effects was observed in the reaction d (n, np) n at 200 MeV in the configuration where one arm was fixed and the other scanned the angular interval. Contribution from relativistic effects can reach up to 60%. Deuteron - proton breakup reaction is investigated in the energy range 300 - 500 MeV in specific areas of the phase space, where the influence of short-range correlations and in some cases also relativistic effects should be remarkable.

Primary authors: JANEK, Marian (Zilina University, Slovakia); Dr LADYGIN, V.P.; MEZHENSKA, O.; LIVANOV, A.N.; TEREKHIN, A.A.; PIYADIN, S.M.; REZNIKOV, S.G.; ISUPOV, A.Yu.; GURCHIN, Yu.V.; KURILKIN, P.K.; KARACHUK, J-T.

Presenter: JANEK, Marian (Zilina University, Slovakia)

Session Classification: Section 4. Relativistic nuclear physics, elementary particle physics and high-energy physics

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