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Short-Range Structure of the Deuteron on the Light-Front

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We study electro-disintegration of the deuteron at high momentum transfer aimed at describing its short-distance structure. Such studies are relevant for a number of phenomena related to high density nuclear matter, relativistic NN-interaction and at short distances nuclei structure in general. Due to the relativistic nature of the process, the theoretical framework is based on light-front approach, which allows a complete relativistic treatment of all components of the reaction, such as deuteron wave function, bound nucleon electromagnetic current, as well as final state interaction of fast struck nucleon with the spectator nucleon. The main advantage of the approach is that it allows effectively to account for the vacuum fluctuation contributions which are essential for processes that probe deuteron with large relative momentum of its nucleon constituents. We compare our calculations with the prediction of non-relativistic calculation as well as provide a preliminary comparisons with the experimental data being measured at Jefferson Lab.

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