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Two-nucleon correlations and the generalized contact formalism

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Nuclear short-range correlations (SRCs), i.e. the probability of finding few nucleons close to each other inside the nucleus, are an integral part of the description of nuclear systems, important also for neutrons-star structure and for the bound nucleon structure function. To study the implications of such correlations, we use a new theoretical tool, called the generalized contact formalism. In this talk I will present the original contact formalism, designed for atomic systems, and our generalization to nuclear systems. Using this formalism, we have been able to identify and quantify the effects of two-body SRCs on various nuclear quantities. Among these quantities are the one-body and two-body momentum distributions and the Coulomb sum-rule. Recently, analyzing the nuclear spectral function, we were also able to utilize the contact formalism to study exclusive electron scattering experimental data, which is one of the main experimental tools for studying SRCs. Most of our predictions were verified experimentally or numerically.