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Possible Universal Properties of Correlated High Momentum Fermions¹

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We discuss theoretical implications of the recent experimental observation of the dominance of tensor interaction in the \sim 250-600 MeV/c momentum range of nucleons in the nuclei. Based on this observation we predicted two new properties for high-momentum distribution of nucleons in asymmetric nuclei which may have significant impact on the dynamical structure of the high density asymmetric nuclear matter. Another prediction is based on the observation that NN correlations in the above mentioned momentum range interact at much shorter distances than the average interaction in the nucleus. We demonstrate how this condition can lead to the phenomenon of contact in atomic nuclei. Finally, we discuss universality of our observations for any two-component fermi systems that contain short range interaction between unlike components and discuss examples ranging from cold atoms to QCD.

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