Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Triplet pairing in pure neutron matter SARATH SRINIVAS, SUNETHRA RAMANAN, Indian Inst of Tech-Madras — We study the zero temperature BCS gaps for the triplet channel in pure neutron matter using Similarity Renormalization Group (SRG) evolved interactions. We use the dependence of the results on the SRG resolution scale, as a tool to analyze medium and many-body corrections. In particular, we study the effects of including the three-body interactions at leading order, which appear at N2LO in the Chiral EFT, as well as that of the first-order self-energy corrections on the zero temperature gap. In addition we also extract the transition temperature as a function of densities and verify the BCS scaling of the zero temperature gaps to the transition temperature. We observe that the self-energy effects are very crucial in order to reduce the resolution scale dependence of the results, while the three-body effects at the leading order do not change the two-body resolution scale depdendence. On the other hand, the results depend strongly on the three-body cut-off, emphasizing the importance of the missing higher-order three-body effects. We also observe that self-energy effects reduce the overall gap as well as shift the gap closure to lower densities.

Sunethra Ramanan
Indian Inst of Tech-Madras

Date submitted: 28 Jun 2016 Electronic form version 1.4