Non-perturbative behavior of the Pomeranchuk quantum phase transition of a nematic Fermi fluid MICHAEL LAWLER, VICTORIA FERNANDEZ, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign — A nematic phase of an electron gas was predicted by Oganesyan et. al.[1] using a mean field approach by tuning the quadrupolar Landau paremeter F_2 to the Pomeranchuk quantum critical point at $F_2 \sim -1$. We will present a study of the behavior at this QCP beyond the perturbative results of [1] using non- perturbative methods of higher dimensional bosonization. We extend the results on the Fermion residue calculated by Castro Neto and Fradkin for the Landau fermi liquid phase[2] to this case and present a calculation of the Fermion Green's Function at the critical point.
[1] Oganesyan, V., Kivelson, S. A., and Fradkin, E., Phys. Rev. B. **64** 195109 (2001)
[2] Castro Neto, A. H., Fradkin, E. H., Phys. Rev. B. **51** 4084 (1995)

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