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Non-Fermi Liquid Behavior of Nematic Fermi Fluids MICHAEL LAWLER, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign — Following the initial study of Ref. 1, we explore the behavior of physically relevant quantities in the vicinity of the quantum critical point between a nematic Fermi fluid and a Fermi liquid. As shown in Ref. 1, this strong coupling fixed point is completely accessible within the method of high dimensional bosonization and we continue the analysis presented therein focusing on quasiparticle properties, such as the fermion residue and the fermion spectral function. We show in particular, that the fermion residue vanishes according to the essential singularity $\exp(-1/\sqrt{\delta})$ where δ is the dimensionless coupling constant measuring the distance to the critical point. Also, at low temperatures, we verify explicitly that the heat capacity obey's the non-Fermi liquid powerlaw of $T^{2/3}$. We conclude with a discussion of the signatures of the nematic phase that would appear in light scattering and angle resolved photo emission spectroscopy experiments.

[1] Lawler, Barci, Fernandez, Fradkin and Oxman, unpublished; cond-mat/0508747.

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