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Derivation of the Marginal Fermi Liquid for the Cuprates VIVEK AJI, CHANDRA VARMA, UC Riverside — The statistical mechanics of the time-reversal and inversion symmetry breaking order parameter, possibly observed in the pseudogap region of the phase diagram of the Cuprates,can be represented by the Ashkin-Teller model. We add kinetic energy and dissipation to the model for a quantum generalization and show that the correlations are determined by two sets of charges, one interacting locally in time and logarithmically in space and the other locally in space and logarithmically in time. The quantum critical fluctuations are derived and shown to be of the form postulated in 1989 to give the marginal fermi-liquid properties. The model solved and the methods devised are likely to be of interest also to other quantum phase transitions.

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