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Fractionalized Fermi liquids as ground states of single band tJ models MATTHIAS PUNK, SUBIR SACHDEV, Harvard University — Recently it has been argued that the normal state of underdoped cuprates might realize a fractionalized Fermi liquid (FL*), where electron-like quasiparticles couple to fractionalized excitations of a fluctuating antiferromagnetic background. The corresponding Fermi surface consists of pockets, the area of which is determined by the density of doped charge carriers alone as opposed to the total density of electrons, thereby violating Luttinger's theorem. Most previous studies of the FL* phase were based either on two-band models such as the Kondo lattice model, or on phenomenological models where Fermions are coupled to a fluctuating unit vector field representing the local Neel order. In this talk I will show that the FL* phase can indeed arise as the ground-state of a single band tJ model and discuss its implications.

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