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Angle dependent quasiparticle weights in correlated metals POUYAN GHAEMI, Massachusetts Institute of thechnology, SENTHIL TODADRI, Massachusetts Institute of Technology, PIERS COLEMAN, Rutgers University — The variation in the quasiparticle weight Z on moving around the fermi surface in correlated metals is studied theoretically. Our primary example is a heavy Fermi liquid treated within the standard hybridization mean field theory. The most dramatic variation in the quasiparticle weight happens in situations where the hybridization vanishes along certain directions in momentum space. Such a "hybridization node" is demonstrated for a simplified model of a Cerium-based cubic heavy electron metal. We show that the quasiparticle weight varies from almost unity in some directions, to values approaching zero in others. This is accompanied by a similar variation in the quasiparticle effective mass. Some consequences of such hybridization nodes and the associated angle dependence are explored. Comparisons to somewhat similar phenomena in the normal metallic state of the cuprate materials are discussed. A phenomenological picture of the pseudogap state in the cuprates with a large Fermi surface with a severely anisotropic spectral weight is explored.

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