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Low temperature transport in correlated systems and its evolution under pressure

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The low-temperature transport coefficients of the degenerate periodic SU(N) Anderson model are calculated in the limit of infinite correlation between f electrons, within the framework of dynamical mean-field theory. We establish the Fermi-liquid (FL) laws in the clean limit, taking into account the quasiparticle damping. The latter yields a reduced value of the Lorenz number in the Wiedemann-Franz law. Our results indicate that the renormalization of the thermal conductivity and of the Seebeck coefficient can lead to a substantial enhancement of the electronic thermoelectric figure of merit at low temperature. Using the FL laws, we discuss the low-temperature anomalies that show up in the electrical resistance of the intermetallic compounds with cerium and ytterbium ions when studied as a function of pressure. Our calculations explain the sharp maximum of the coefficient of the T^2 term of the electrical resistance and the rapid variation in residual resistance found in a number of Ce and Yb intermetallics at some critical pressure.