Abstract Submitted
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On the X-ray-Problem in the Falicov-Kimball model in large dimensions at half-filling GERD CZYCHOLL, FRITHJOF B. ANDERS, Department of Physics, Universität Bremen, P.O. Box 330 440, D-28334 Bremen, Germany — The f-electron spectral function of the Falicov-Kimball model is calculated within the dynamical mean-field theory using the numerical renormalization group method as the impurity solver. Both the Bethe lattice and the hypercubic lattice are considered at half filling. For small U we obtain a single-peaked f-electron spectral function, which –for zero temperature– exhibits an algebraic (X-ray) singularity ($|\omega|^{-\alpha}$) for $\omega \to 0$. The characteristic exponent α depends on the Coulomb (Hubbard) correlation U. This X-ray singularity cannot be observed when using alternative (Keldysh-based) many- body approaches. With increasing U α decreases and it vanishes for sufficiently large U when the f-electron spectral function develops a gap and a two-peak structure (metal-insulator transition).

Frithjof Anders
Department of Physics, Universität Bremen, P.O. Box 330 440, D-28334 Bremen

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