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Electronic Raman scattering in the Falicov-Kimball model

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The dynamical mean field theory (DMFT) and dynamical cluster approximation (DCA) solutions for the electronic Raman scattering in the Falicov-Kimball model are proposed. Within DMFT approach, which is exact in infinite dimensions, the existence of isosbestic point and the importance of resonant effects that may dramatically enhance non-resonant features in Raman spectra is shown.

On the other hand, in order to check whether the features we obtained in Raman spectra will survive in low dimensions we employ DCA technique to solve for non-resonant electronic Raman scattering in two-dimensional Falicov-Kimball model. We present results for the non-resonant Raman spectra for different scattering geometries and optical conductivity at half filling on both sides of metal-insulator transition.

Keywords : Raman scattering, Falicov-Kimball model