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【125】Understand the photoinduced phase transition of the monoclinic VO2 with the nonequilibrium DMFT

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The ultrafast dynamics in the quantum many-body systems introduces the novel photoinduced phase transition (PIPT) to the family of quantum phase transitions. In the VO2, although the thermal-induced metal-to-insulator transition due to the lattice distortion has been explained with cluster DMFT since 2005, it was verified only a few years ago in the experiment that the photoexcitation is also able to induce the PIPT from the insulating phase to a transient metal state without crystallographic change.
In our work, with the state-of-the-art realistic nonequilibrium DMFT simulation, we consistently demonstrated the strategies of the ultrafast in-gap charge carriers, which are sensitive to the frequency and polarization of the laser pump.

Theoretical Work

Theory

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