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Probing and characterization of hot-phonons in nonequilibrium setups

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The appearance of hot-phonons states in pump-probe experiments as a powerful tool for characterizing the time-dynamics of the energy flows, as well in perspective of engineering on/off switchs based on the lattice degrees of freedom and for heat transport. While these features were initially thought to be specific of semiconductors, hot-phonons has been recently predicted and observed as well in metal systems under particular conditions.
In this contribution, taking MgB2 as example, we discuss the different possible ways for revealing and characterizing hot-phonons, spanning from time-resolved optics, spectroscopy and probes of the lattice dynamics.

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