26. Deutsche Physikerinnentagung 2022 (German Conference of Women in Physics)



Contribution ID: 47

Type: Poster

Lattice-driven femtosecond magnon dynamics in α -MnTe investigated with linear spin wave theory

Saturday, November 26, 2022 4:00 PM (2 hours)

The femtosecond sublattice dynamics in the antiferromagnetically ordered phase of the semiconductor α -MnTe are calculated using the linear spin wave theory [1]. We assume that collective lattice vibrations generated by laser pulses induce an oscillating Heisenberg coupling and thus a driving that generates magnons. The calculated antiferromagnetic order parameter shows damped coherent longitudinal oscillations, which decay due to dephasing. We also include a phenomenological dissipative term to describe spin-lattice relaxation processes, which lead to relaxation back to thermal equilibrium. In addition, we provide approximate analytic solutions of the differential equations to understand the effect of the amplitude, frequency, and lifetime of the driving.

[1] K. Deltenre, D. Bossini, F. B. Anders, and G. S. Uhrig, Phys. Rev. B 104, 184419 (2021)

Category

Solid State (Theory)

Authors: DELTENRE, Kira (Department of Physics, TU Dortmund University, D-44227 Dortmund); UHRIG, Götz S. (Department of Physics, TU Dortmund University, D-44227 Dortmund); ANDERS, Frithjof B. (Department of Physics, TU Dortmund University, D-44227 Dortmund)

Presenter: DELTENRE, Kira (Department of Physics, TU Dortmund University, D-44227 Dortmund)

Session Classification: Poster session

Track Classification: Physics Posters