

Separating Nuclear Spin Isomers Using a Pump-Dump Laser Scheme

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Abstract The concept of nuclear spin isomers was already introduced in the early days of quantum mechanics. Despite its importance, not much work has been done to separate them experimentally by pushing the ratio away from its equilibrium value. We propose to use ultrashort laser pulses in a pump-dump like experiment to enhance the ratio between different spin isomers. Exemplary wave packet simulations with optimized femtosecond pump and dump laser pulses are shown on a quinodimethane derivative to illustrate that the ratio between two different groups of spin isomers is enhanced.

Keywords Pump-Probe Spectroscopy · Quantum Dynamics · Nuclear Spin Isomers

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