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Laser-induced ultrafast spin dynamics and ERASE functionality on quasilinear molecular ions GEORGIOS LEFKIDIS, University of Kaiserslautern and Research Center OPTIMAS, CHUN LI, SHAOBIN ZHANG, Northwestern polytechnical University, Xi'an, China, WOLFGANG HÜBNER, University of Kaiserslautern and Research Center OPTIMAS — We present an *ab initio* investigation of the Λ-process-based ultrafast spin manipulation on positively charged two-magnetic-center molecular ions bridged by non-magnetic oxygen[1]. Multiple derived spin-switching and spin-transfer scenarios on the quasilinear structure [Fe-O-Co]$^+$ are used to build two closed, irreversible spin-dynamics cycles with respect to the spin localization and orientation. A mechanism addressing the "ERASE" functionality is proposed by properly exploiting the irreversibility of some laser-induced spin-manipulation scenarios, and the resulting Shannon entropy change is analyzed. We compare with a presiously suggested mechanism based on chirped laser pulses[2]. Such controllable spin-dynamics cycles and logic functionality demonstrate promising applications in the design of spintronic devices on isolated magnetic molecules[3].

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