Abstract Submitted
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Ab initio **investigation of ultrafast spin-manipulation: Λ processes in charged two-magnetic-center nanostructures with bridging atoms**[1] CHUN LI, Northwestern Polytechnical University, WEI JIN, GEORGIOS LEFKIDIS, WOLFGANG HÜBNER, Kaiserslautern University of Technology — We present a fully *ab initio* investigation of ultrafast laser-induced magnetic switching mechanisms in charged two-magnetic-center nanostructures via Λ processes [1,2]. In order to improve the spin transferability between the magnetic centers and fulfill the energy-difference requirements for the Λ processes [3], a small number of non-magnetic bridging atoms (O and Mg) is used to connect the magnetic centers. These bridging atoms influence the overlap between the magnetic centers. It is shown that both bridging atoms can redistribute the spin density on the structure by changing either the local spin density or even the total spin localization. Especially, the spin-transfer scenario achieved in [Fe-O(Mg)-Co]$^+$ confirms that using bridging atoms can significantly enhance the spin transferability between the magnetic centers.
[1] C. Li, T. Hartenstein, G. Lefkidis *et al*, PRB **79**, 180413(R) (2009).
[2] T. Hartenstein, C. Li, G. Lefkidis *et al*, JPD **41**, 164006 (2008).
[3] G. Lefkidis, G. P. Zhang, and W. Hübner, PRL **103**, 217401 (2009).

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