SUPPLEMENTAL MATERIAL

Pressure-induced Multi-step and Self-organized Spin States in an Electro-elastic Model for Spin-crossover Solids

Mamadou Ndiaye^{a,b}, and Kamel Boukheddaden^{a*} ^aUniversité Paris-Saclay, UVSQ, CNRS, GEMaC, 45 Avenue des Etats Unis, 78035 Versailles, France ^bUniversité Cheikh Anta Diop de Dakar, Département de Physique, FST, BP 5005, Fann, Dakar, Sénégal (Dated: March 16, 2022)

 $^{^{\}ast}$ Corresponding author. E-mail: kamel.boukheddaden@uvsq.fr



Figure S1: Spatial organization of the spin states (HS red, LS blue) in the case of re-entrant phase transition showing (a) a transformation of domains nucleation from the four corners on cooling (resp. on heating) relative of first-order transition behaviour which transforms in (b) under the form of labyrinth structures composed of ramified strings by increasing the pressure on cooling and in (c) the reappearance of the single domain propagation from one corner with some droplets around the front transformation on cooling and on heating. Remark the decrease of the volume of the lattice from P = 0 to P = 5 kbar, which increasing in turn on cooling from HS to LS for P = 5 kbar.



Figure S2: Self-organization of the spin states (HS red, LS blue) of pressure-induced survived thermal hysteresis during the cooling and heating process showing a formation of domains starting from the four corners at zero pressure (b) to a formation of single domain by increasing the pressure (a); P = 2 (b) and P = 3.5 kbar (c). Note the decrease of the volume of the lattice from P = 0 to P = 3.5 Kbar.

Kamel BOUKHEDDADEN: https://orcid.org/0000-0003-0464-1609 Mamadou NDIAYE: https://orcid.org/0000-0001-9370-379X