



HAL
open science

Coupled ferroelastic distortion and spin crossover in the $\text{Fe}(\text{PM-PEA})_2(\text{NCS})_2$ system: a Landau theory approach

Ricardo G. Torres, Francisco Javier Valverde Muñoz, Elzbieta Trzop, Eric Collet, Guillaume Chastanet

► To cite this version:

Ricardo G. Torres, Francisco Javier Valverde Muñoz, Elzbieta Trzop, Eric Collet, Guillaume Chastanet. Coupled ferroelastic distortion and spin crossover in the $\text{Fe}(\text{PM-PEA})_2(\text{NCS})_2$ system: a Landau theory approach. Journées Scientifiques de l'Association Française de Magnétisme Moléculaire 2022, Nov 2022, Dourdan, France. hal-03857174

HAL Id: hal-03857174

<https://hal.science/hal-03857174>

Submitted on 17 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Coupled ferroelastic distortion and spin crossover in the $\text{Fe}(\text{PM-PEA})_2(\text{NCS})_2$ system: a Landau theory approach

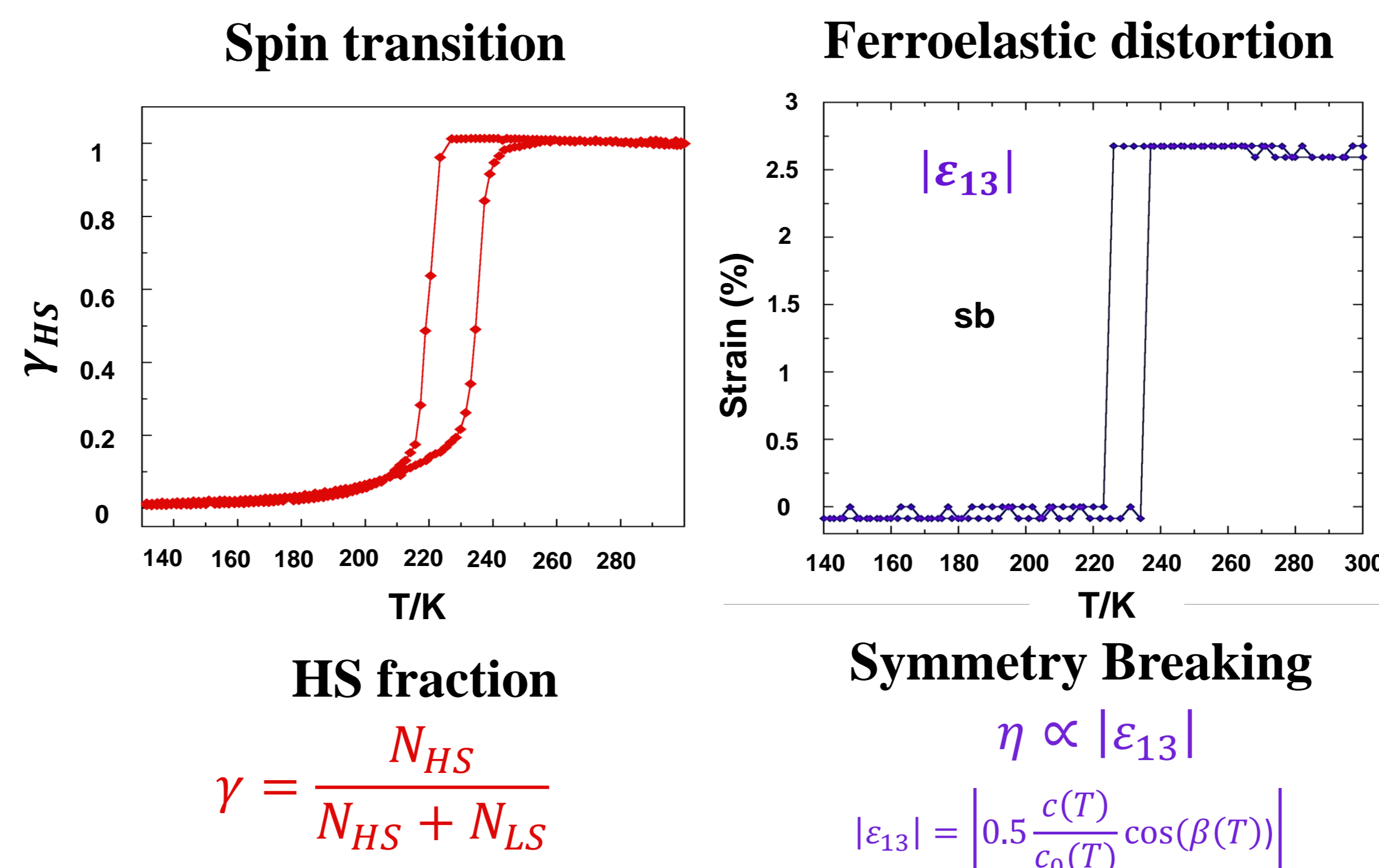
Ricardo G. TORRES¹, Francisco Javier VALVERDE-MUÑOZ^{1,2}, Elzbieta TRZOP^{1,3}, Eric COLLET^{1,3}, Guillaume CHASTANET⁴

¹Univ Rennes, CNRS, IPR (Institute de Physique de Rennes), UMR 6251, F-35000 Rennes, France; ²Instituto de Ciencia Molecular, Departamento de Química Inorgánica, Universidad de Valencia, 46980 Paterna, Valencia, Spain; ³DYNACOM IRL2015 University of Tokyo - CNRS - URI, Department of Chemistry, 7-3-1 Hongo, Tokyo 113-0033 – Japan; ⁴ICMCB – UMR5026 87, Avenue du Docteur Schweitzer 33608 PESSAC cedex, France.

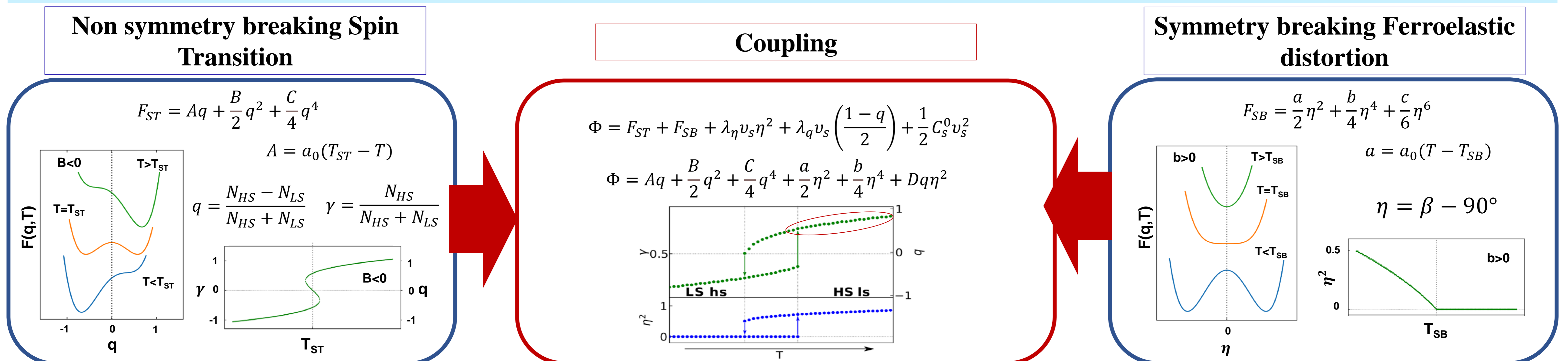
$\text{Fe}(\text{PM-PEA})_2(\text{NCS})_2$

- SCO mononuclear complex.
- Spin transition \rightarrow Unsymmetric hysteresis loop.
- **Unusual behavior:**
 - Low T, low-spin (LS) phase is high symmetry (hs): Orthorhombic Pccn
 - High T, high-spin (HS) phase is low symmetry (ls): Monoclinic $P2_1/c$
- **Motivation:**
 - Understand:
 - Coupling (symmetry breaking ferroelastic distortion and non symmetry breaking spin transition)
 - HS ls and LS hs phases

Experimental curves



Previous Theoretical Model (Collet & Azzolina, 2021)



Strong coupling limit model

