

Session D41 - Poster Session I.

*POSTER session, Monday evening, March 17
Exhibit Hall D, Conv. Center*

[D41.109] Characterisation of Thermo-elastic Martensitic Transformation in NiTi and FeMn Alloys Driven by Temperature Variation and External Stress

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Recently, we have proposed a theory to analyse the first-order phase transitions (FOPT) in solids[1]. In order to test the concept of the physics of dissipation during FOPT in solids, we study here Martensitic transformations in FeMn and NiTi alloy samples for this purpose. We investigate the characteristic of transformations in these two alloys and measure the dependence of internal friction(IF) during transformations in varying rate of temperature and vibration frequency. Using the experimental data, we were able to calculate the numerical values of two crucial indices(the effective driving index and the coupling index) for the samples during heating and cooling process and provide physical interpretations for them in our analysis, based on the FOPT theory developed[1]. Furthermore, we extend our theory of FOPT to analyse stress-induced phase transition and arrive at similar explicit representation of the relevant physical quantities. [1] J.X. Zhang, P.C.W. Fung, W.G. Zeng, Phys. Rev B, 52, 268,1995.