

The control of magnetism near metal-to-insulator transitions of VO₂ nano-belts

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ABSTRACT:

The magnetic properties of paramagnetic/weakly ferromagnetic films are strongly affected by the proximity to materials that undergo a metal to insulator phase transition. Here, we show that under the deposition conditions associated with structural changes near the metal-insulator phase transition of VO₂ produces magnetoelastic anisotropy. We observe intrinsic paramagnetic centres (PM-C) both at the near film surface and bulk/deep PM-C that are affected by the metal-insulator phase transition in VO₂. We study the evolution of vibrational modes of VO₂ thin films in the vicinity of the phase transition by using temperature controlled-Raman microscopy.