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Static and dynamic properties of Single-Chain Magnets with broad domain walls ALESSANDRO VINDIGNI, THOMAS MICHAELS, Laboratory for Solid State Physics, ETH Zurich, Switzerland, ORLANDO BILLONI, Universidad Nacional de Cordoba, Argentina, DANILO PESCIA, Laboratory for Solid State Physics, ETH Zurich, Switzerland — It is well-known that long-range order cannot occur in 1d magnetic systems with short-range interactions. Remanent magnetization may, however, be observed in anisotropic spin chains due to slow dynamics. The physics of such systems – called Single-Chain Magnets (SCMs) – is mainly dictated by the temperature dependence of the relaxation time (τ) and the correlation length (ξ). The behavior of τ and ξ is, in turn, determined by domain-wall (DW) excitations. Both statics and dynamics are dependent on whether DWs extend over more than one lattice distance (*broad*) or not (*sharp*). The transition from one regime to the other is controlled by the strength of the magnetic anisotropy energy with respect to the exchange interaction. For broad domain walls, we found that the interplay between localized excitations and spin waves turns crucial at finite temperatures. Moreover, all the relevant quantities display universal behaviour, provided that temperature is measured in units of DW energy and distance in units of DW widths. These facts allowed us to explain the experimental behavior of a class of Mn-based SCMs with broad DWs and may also be relevant to the study of metallic nanowires.

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