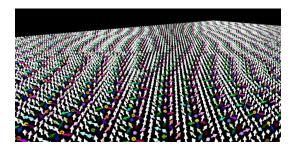
Progress in modeling and analysis for nanomagnetism and related topics



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Rectifiability of entropy productions for weak solutions of the 2D eikonal equation with supercritical regularity

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Weak solutions of the 2D eikonal equation correspond to unit vector fields m with zero divergence in the sense of distributions. They arise naturally as sharp interface limits of bounded energy configurations in micromagnetics, elasticity or liquid crystal models (e.g. Aviles-Giga). For a given weak solution m, entropy productions are distributions which carry information about singularities and energy cost. If they are signed measures, it is conjectured that they must be concentrated on the 1-rectifiable jump set of m, as they do if m has bounded variation (BV). In a joint work with Elio Marconi, we prove this concentration property under an additional mild regularity assumption, going well beyond the BV setting, and leaving only a borderline case open.

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