

Internal Seminar

Kinetics of phase-ordering in triple-well model Landau free energies for martensites

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We study phase-ordering dynamics of 1-D Bales-Gooding triple-well model free energy^[1] in 2- and 3-spatial dimensions^[2,3], and with added power-law interactions for square-rectangle martensitic transition^[2,4]. After quenching a dilutely seeded austenite below a first-order transition, we find dynamical scaling in strain-strain correlation functions with a coarsening length $L(t) \sim t^\alpha$ and Porod's tail in structure factor for sharp interfaces^[3,4]. The exponent α behavior is understood by inserting the dynamical scaling ansatz into correlation function dynamics whose solutions $g(t) \equiv 1/t^\alpha$ have exponent values matching with simulations ^[3].

REFERENCES

[1] G.S. Bales and R.J. Gooding, Phys. Rev. Lett. 67, 3412 (1991).

[2] T. Lookman, S.R. Shenoy, K.Φ, Rasmussen, A. Saxena, and A.R. Bishop, Phys. Rev. B 67, 024114 (2003).

[3] N. Shankaraiah, Awadhesh Kumar Dubey, Sanjay Puri and S.R. Shenoy, (Under review with Phys. Rev. B).

[4] N. Shankaraiah, Sanjay Puri and Subodh R. Shenoy, (Manuscript under preparation).

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11:30 AM (Tea/Coffee at 11:15 AM)

Seminar Hall, TCIS