

Discrete-to-Continuum variational methods

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I review some recent results regarding the description of the behaviour of energy-driven discrete systems, and more precisely lattice systems, through the construction of approximate continuous problems. On one hand methods of weak convergence, homogenization, integral representation and gradient flow dynamics already used for continuum problems have been adapted to the discrete setting, on the other hand the new discrete dimension has brought new phenomena, novel problems and interesting results. I will limit my description to systems with interfacial energies, but focus on methods that can be adapted to a more general multi-scale analysis.