

We present a generic framework for phase field modelling , which gives a natural and thermodynamically consistent extension to non-isothermal modelling, and allows current phase field models to be seen in a wider context. This framework, introduced by Beris and Edwards in the 90s, is an extension of the Poisson bracket of Hamiltonian mechanics to include dissipative phenomena. We demonstrate the working of this formalism, present new solidification models by deriving temperature equations for single and more general phase field models, including those with density dependency.