Modelling the solidification of ductile cast iron parts with varying wall thicknesses

In the present paper modelling the solidification of cast iron parts is considered. Common for previous efforts in this field is that they have mainly considered thin walled to medium thickness castings. Hence, a numerical model combining the solidification model presented by Lesoult et al. [1] with a 2D FE solution of the heat conduction equation is developed in an in-house code and model parameters are calibrated using experimental data from representative castings made of ductile cast iron. The main focus is on the influence of casting thickness and resulting local cooling conditions on the solidification pattern and the relation to formation of degenerate graphite.