

1145-35-1326

Jean-Luc Fattebert*, Oak Ridge National Laboratory, One Bethel Valley Rd, Oak Ridge, TN 37831, and **Balasubramaniam Radhakrishnan** and **John A. Turner**. *Recent progress and challenges using phase-field models for quantitative modeling of rapid solidification.*

The phase-field model is a very powerful method that allows tracking of interfaces in 3D. While the basic idea is rather simple — using a field that takes a different constant value on each side of the interface and smoothly changes value near that interface — and leads to beautiful pictures without too much efforts, making it a tool for quantitative predictions is much more challenging. More specifically, it is desirable that numerical results do not depend on the interfacial width associated with this diffuse interface. Obtaining results that also do not depend on numerical noise in the case of interface instabilities can also be challenging. In this talk we will describe some of these challenges for applications to rapid solidification of metallic alloys as they occur in the additive manufacturing process, as well as some recent progress towards this goal. (Received September 21, 2018)