SESSION 8: POSTER, GRAND PACIFIC BALLROOM
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A parallel 3D phase-field simulation of multi-grain growth based on the full thread tree

Ya-jun Yin; Min Wang; Jian-xin Zhou; Dun-ming Liao; Xu Shen; Tao Chen, Huazhong University of Science and Technology

ABSTRACT

The phase-field simulation for multiple grains growth has been accelerated by using a parallel computing method. To perform the simulation of multi-grain growth based on the phase-field method, we have developed a program code with the OpenMP technology. In this paper, the implementation technique of the phase-field model is presented, and the acceleration performance of the solidification simulation in three-dimension by using the presented parallel computing program code has been evaluated. The results show that the adaptive mesh based on full thread tree can guarantee the accuracy of the simulation, and the parallel computing technique can be used based on it. From the obtained results, the computing efficiency has been improved greatly by the presented technology, and we can confirm the feasibility of realizing a real-time full three-dimensional phase-field simulation of multi-grain growth on a personal computer.

KEYWORDS: parallel, phase-field, multi-grain growth, full thread tree