

Phase-field Simulation of Sintering

Keywords: sintering, phase-field simulation, data assimilation



National Institute for Materials Science

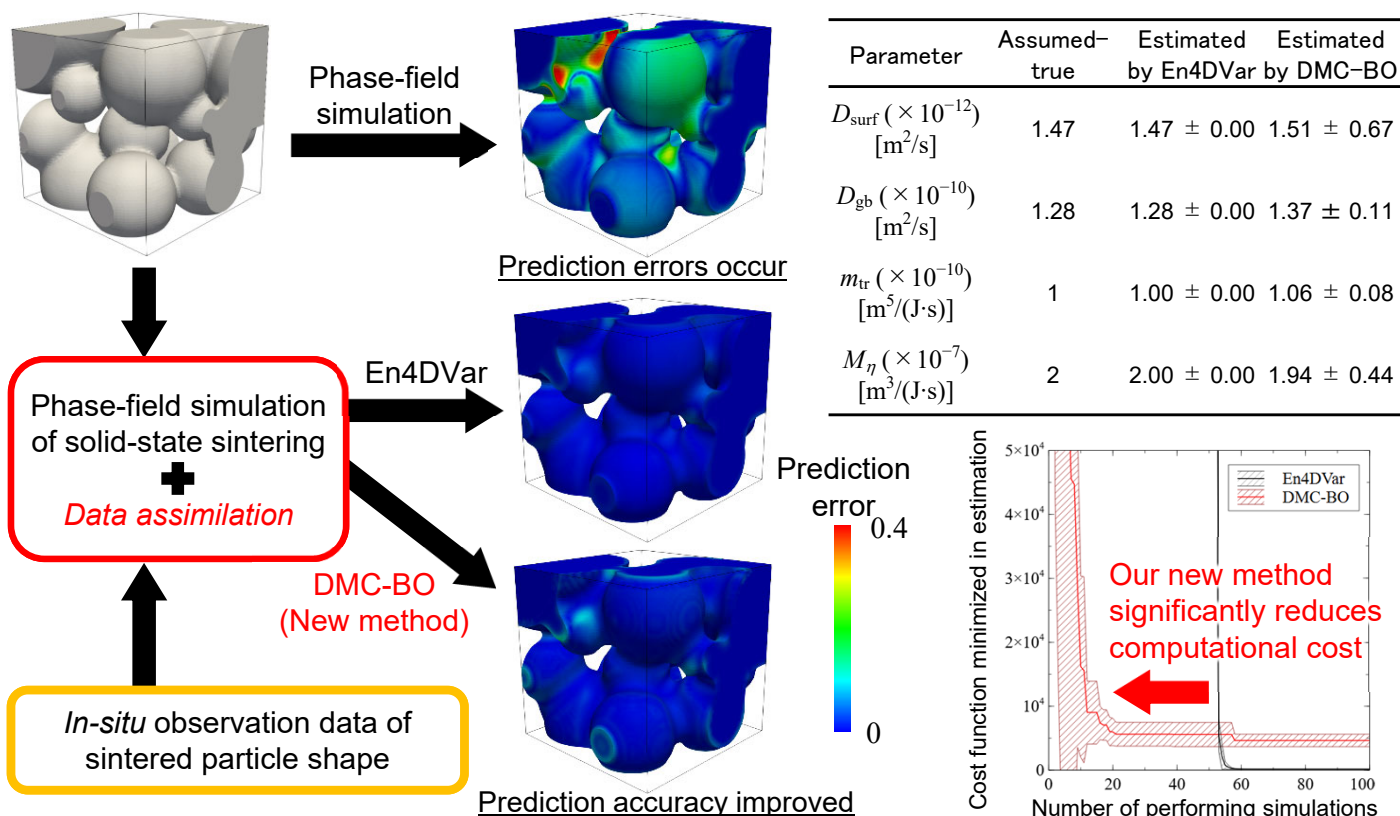
Background

Sintering is a fundamental technology to provide various materials. Because the properties of the sintered materials depend on their microstructure, the evolutions of the microstructure during the sintering should be controlled and predicted.

Aim

Quantitatively predict the microstructural evolution during the sintering process by integrating numerical simulation using phase-field method with data assimilation which enables the estimation of states and parameters based on experimental data.

Advanced Research Topics



Publications

- A. Ishii et al., *Model. Simul. Mater. Sci. Eng.* **29** (2021), 065012.
- A. Ishii et al., *Mater. Today Commun.* **30** (2022), 103089.
- A. Ishii et al., *Adv Theory Simul.*, under review.

Summary

- Developed a new framework of the data assimilation for the solid-state sintering.
- Demonstrated the developed framework can simultaneously estimate multiple unknown material parameters with high accuracy.

Research outcome

- This study will lead to quantitative numerical prediction of the microstructural evolution based on experimental data that helps to develop sintered materials more efficiently and at lower cost.



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