FOSSEE, IIT Bombay
OpenFOAM Research Migration Project
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Synopsis

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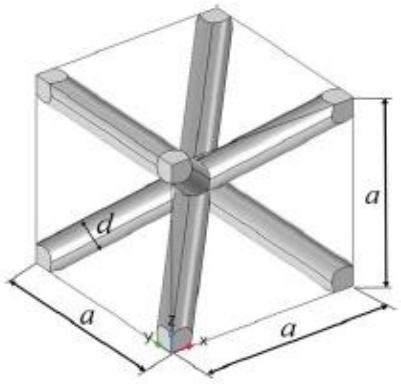
Simulation of the Effective Thermal Conductivity Calculation of BCC Lattice Structure

This research migration project aims to simulate the effective thermal conductivity of a BCC lattice-like structure. To calculate the effective thermal conductivity of a lattice structure (Porous Structure), we need to have a solid BCC lattice structure and also need to have a stagnant fluid in between that solid. The research on lattice structures is going on rapidly and effective thermal conductivity calculation is one of the primary steps of that research. This project aims to reproduce the effective thermal conductivity study of BCC lattice at different porosity levels from S.Takarazawa [1] et al. journal paper. The authors of the paper use COMSOL Multiphysics 5.3a (a commercial tool) to simulate the study. In this research migration project, I will simulate the effective thermal conductivity of BCC lattice using OpenFOAM and compare the results with the paper. A BCC lattice is shown below.



References

[1] S. Takarazawa, K. Ushijima, R. Fleischhauer, J.Kato, K. Terada, W. J. Cantwell, M. Kaliske, S. Kagaya, S. Hasumoto, Heat-transfer and pressure drop characteristics of micro-lattice materials fabricated by selective laser metal melting technology, (2022) 125–141.