



Modelling and Simulation in Engineering

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Research Article

Open-Source Software in Computational Research: A Case Study

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Abstract

A case study of open-source (OS) development of the computational research software MFIX, used for multiphase computational fluid dynamics simulations, is presented here. The verification and validation steps required for constructing modern computational software and the advantages of OS development in those steps are discussed. The infrastructure used for enabling the OS development of MFIX is described. The impact of OS development on computational research and education in gas-solids flow, as well as the dissemination of information to other areas such as geophysical and volcanology research, is demonstrated. This study shows that the advantages of OS development were realized in the case of MFIX: verification by many users, which enhances software quality; the use of software as a means for accumulating and exchanging information; the facilitation of peer review of the results of computational research.

Abstract

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