ADVANCES IN OPEN-SOURCE SOFTWARE FOR SOLVING PROBLEMS IN COMPUTATIONAL MECHANICS

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SUMMARY

A number of high-level open-source software frameworks have been developed over the last decade for the approximate solution of problems in computational solid and fluid mechanics as well as coupled multiphysics or multiscale problems. With these software solutions, the process of generating discrete representations of the underlying mathematical model equations is fully automated, using modern technologies including domain-specific languages (DSL), automatic differentiation tools, form compilation, code optimisation and automated parallelism.

The minisymposium invites contributions discussing recent developments in the area of software for automated computational approaches based on high-level abstraction layers, such as FEniCS\textsuperscript{1}, Firedrake\textsuperscript{2}, and DUNE\textsuperscript{3}. The presented topics may focus on:

- developments in the functional or computational core of such frameworks,
- extensions or additional packages enriching the application space or functionality,
- automated integration of data-driven approaches,
and sharing experience with tackling specific applications using automated software.

References:

[1] \url{https://fenicsproject.org}
[2] \url{https://firedrakeproject.org}
[3] \url{https://www.dune-project.org}