Beitrag ID: **43**   Typ: **nicht angegeben**

preCICE –A General-Purpose Simulation Coupling Interface

Freitag, 28. Oktober 2022 09:45 (45 Minuten)

preCICE is an open-source coupling software for partitioned multi-physics and multi-scale simulations. Thanks to the software's library approach (the simulations call the coupling) and its high-level API, only minimally-invasive changes are required to prepare an existing (legacy) simulation software for coupling. Moreover, ready-to-use adapters for many popular simulation software packages are available, e.g. for OpenFOAM, SU2, CalculiX, FEniCS, and deal.II. For the actual coupling, preCICE offers methods for fixed-point acceleration (quasi-Newton acceleration), fully parallel communication (MPI or TCP/IP), data mapping (radial-basis function interpolation), and time interpolation (waveform relaxation). Today, although being an academic software project at heart, preCICE is used by more than 100 research groups in both academia and industry. The wide variety of application fields ranges from aerodynamics to astronautics, automotive manufacturing, wind energy, biomechanics, biomimetics, marine engineering, nuclear fusion, reactor safety, geophysical systems, and many more.

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Sitzung Einordnung: Invited Talks

Track Klassifizierung: Main Track: Track 1