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Monitoring mesoscale convection simulations with nekRS using JuMonC at Scale

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With the increasing size and complexity of simulations, the need for interactions rises. JuMonC is a user controlled application, that runs parallel to the simulation and offers a REST-API for system monitoring, and is expandable through plugins to allow simulation monitoring and steering as well. This information can then be used multiple ways, for example to be displayed in Jupyter notebooks and dashboards.

In this case we are using it with the GPU enabled Navier Stokes solver nekRS, that is based on the spectral element method to run horizontally extended turbulent convection simulations. This so called mesoscale convection is particularly challenging in the case of stellar convection, because there are no comparable conditions on earth and increasing resolution requirements hinder Direct Numerical Simulations (DNS) as well. Scaling with and without JuMonC on JUWELS Booster has been studied at scale and will be discussed.

JLESC topic

Primary author: WITZLER, Christian

Co-author: BODE, Mathis (Forschungszentrum Jülich GmbH)

Presenter: BODE, Mathis (Forschungszentrum Jülich GmbH)

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