15th JLESC Workshop



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Type: Short talk

JuLES: AI Super-Resolution Models for Large-Scale Simulations at Scale

Wednesday 22 March 2023 16:20 (10 minutes)

Super-resolution tools have been originally invented for image super-resolution but are also increasingly used for improving scientific simulations or data-storage. Examples range from cosmology to urban prediction. One particular network framework, physics-informed enhanced super-resolution generative adversarial networks (PIESRGANs), has been shown to be a powerful tool for subfilter modeling. It is the basis for JuLES (JUelich Large-Eddy Simulation) which has been recently developed to generate AI super-resolution models at scale and accelerate large-scale simulations significantly. This talk highlights important modeling aspects employing PIESRGAN with applications to HPC simulations. The examples range from simple homogeneous isotropic turbulence to finite-rate-chemistry premixed flame kernels. A priori and a posteriori results are presented.

JLESC topic

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