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BEING FAST: ACCELERATING SCIENTIFIC NUMERICAL SIMULATIONS FOR INDUSTRY

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ABSTRACT

Numerical simulations are the backbone of many scientific and industrial applications, and reliability is an essential feature to be fulfilled. The last decades witnessed an increased accuracy in simulation science even for very complex systems, thanks to the access to a larger computational capability.

However, it is clear that a balanced trade-off between the required computational cost and the achieved accuracy needs to be pursued, most of all in many-query settings such as optimization and analysis in industrial or manufacturing processes. For this reason, recent techniques to accelerate the computing time for numerical simulations, such as Reduced order models (ROMs) and scientific machine learning (ML) surrogate models have gained a lot of popularity thanks to their capability to reduce the computing time for numerical simulations while still maintaining a successful level of accuracy.

In this session, we aim to collect several applications where the usage of such techniques enables new industrial workflows, to accelerate and/or to improve the existing ones.

We encourage contributions on applications of recent methods, including but not limited to ROMs and ML-based surrogates, that address computational bottlenecks in industrial simulations. Contributions from industry, spin-offs, and startups are particularly welcome. We also encourage applied-oriented academic contributions to foster dialogue between scientific advances and real-world applications.