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PHYSICAL REDUCED ORDER MODELLING AND MACHINE LEARNING FOR ENGINEERING APPLICATIONS: GET THE BEST FROM BOTH WORLDS

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ABSTRACT

Nowadays, design procedures often involve solving many large-scale numerical simulations, and recycling simulations data to produce lower-dimensional problems using physical reduced order models is becoming a more and more widespread strategy. Besides, machine learning methods have been used for decades to assist the engineer in design tasks, thanks to their practical use, nonintrusiveness and their performance even in cases where models are not available.

In this minisymposium, we investigate the opportunities to get the better of the two worlds, when physical reduced order modelling still solves the physical equation and global equilibrium, while some parts of the numerical process can be treated using machine learning, for instance for classification or regression tasks.