

PHYSICS- AND DATA-DRIVEN MODELLING FOR DIGITAL-TWIN TECHNOLOGIES

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ABSTRACT

Digital twins, the virtual representation of physical systems, have been experiencing increasing popularity due to their potentially transformative role in both design and optimisation, as well as real-time decision making and control. The two main components for digital twins are data and simulators. Despite the advances in communication, digitalisation technologies and efficient modelling techniques certain challenges still remain, with new ones coming to light.

Digital twins should be indistinguishable from their physical counterpart. As such both data and models should be characterised by accuracy and reliability, but also generalisability, security and scalability. Even more so, in time- or operation-critical cases the requirement for efficient data-acquisition and on-the-fly management, along with robust real-time simulators comes to the forefront.

This session aims to gather contributions on enabling technologies for digital twin applications. Contributors are invited to discuss topics ranging from, but not limited to physics-driven modelling, reduced order modelling, scientific machine learning, data-generation, data-management and quality, digitalisation and communication technologies. Topics covering both methodology development and applications are welcome.