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PREDICTIVE DIGITAL TWINS

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MINISYMPOSIUM

This MS will have a special emphasis on enabling technologies for Digital Twins, where we adopt the following definition of a Digital Twin:

A digital twin is defined as a virtual representation of a physical asset, or a process enabled through data and simulators for real-time prediction, optimization, monitoring, control, and decision-making.

We find the use of the capability levels as shown in Figure 1 as very useful when describing a digital twin. The capability levels 1-2 correspond to the virtual twin, whereas 3-5 corresponds to the predictive twin that this MS is focusing on. To enable predictive twins, one may utilize Hybrid Analysis and Modelling (HAM) that combines classical Physic-Based Methods (PBM) accelerated by means of Reduced Order Modelling (ROM) together with Data-Driven Methods (DDM) based on sensor measurement analysed by use of Machine Learning (ML). Pure Data-Driven Methods based on sensor measurement analysed by any means of AI is also welcome. In general, this MS welcome contributions on enabling technologies that can facilitate Predictive Digital Twins. Advanced applications of Predictive Digital Twins are also welcome.

Figure 1. The capapbility levels of Digital Twins on a scale from 0 to 5.