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Digital twinning: Activities on the European XFEL accelerator side

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This contribution gives an overview of two activities regarding “digital twins” of the European XFEL accelerator. The first one is the operation and enhancement of the Virtual XFEL, a clone of the machine control system for testing mid- and high-level software. Using a custom physics simulation written in C++, the Virtual XFEL performs single-particle and envelope tracking in realtime. The second part of the presentation gives an overview of start-to-end simulation methods that attempt to reproduce the physics of electron beam transport in much more detail at the cost of increased computation time.

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Session Classification: Digital Twinning