

Helmholtz-Zentrum Berlin

für Materialien und Energie GmbH

Advancements in Beamline Digital Twin at BESSY II

A beamline digital twin

side view, meridional beam



X-rays

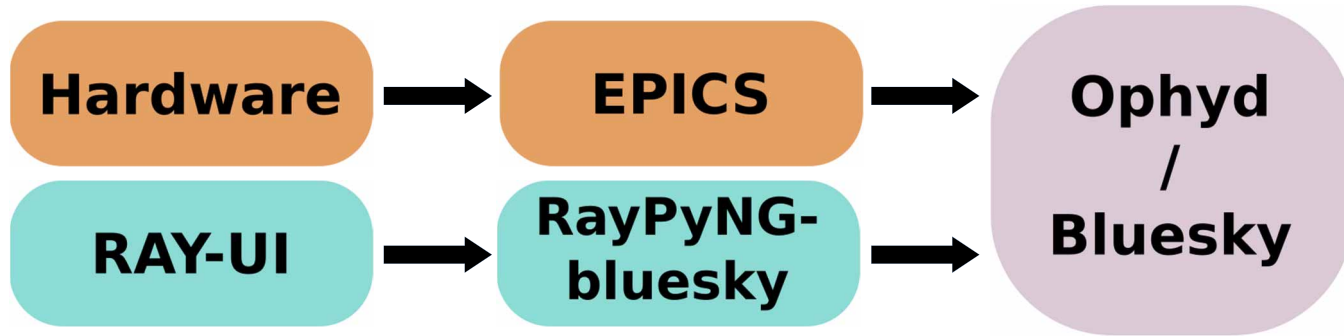
optics

monochromator

Goal: compare beamline performance with design values!

Typically: flux and beamsize at different positions, energy resolution

A beamline digital twin

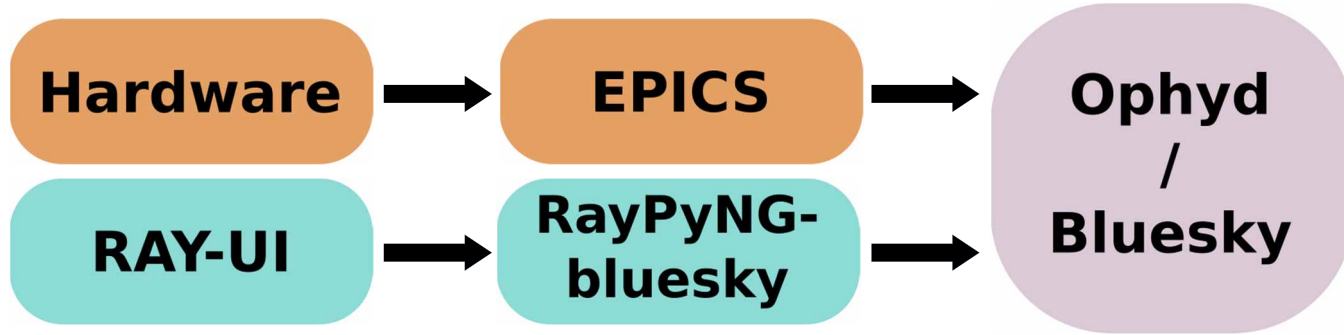


An increasing number of beamlines is adopting Bluesky at BESSY II.

Using Ophyd, that is an hardware abstraction layer, makes it easy to implement simulated devices.

The user experience of provided by Bluesky is preserved, same commands for real and simulated hardware

A beamline digital twin



Centralizing simulations for better efficiency.

Integrates WAVE and WavePy for more accurate X-ray source modeling.

Machine-learning-based surrogate model for RAI-UI.

Sync simulated motor positions with real-world positions in our digital twin, a complex task our machine-learning group is addressing.