

Open, Any-Platform, Leadership-Scale PIC Simulations for Humans (No Hooks Attached)

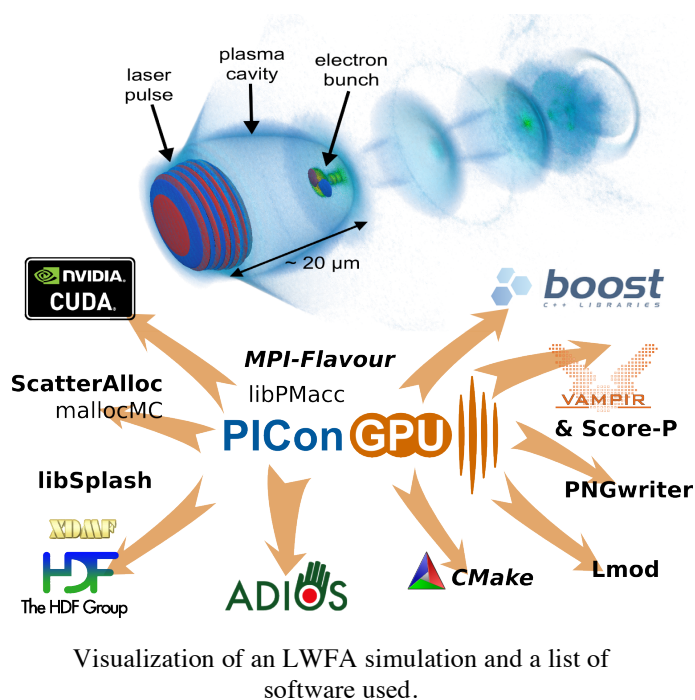
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PIConGPU is a fully open, community-driven, 3D and 2D3V particle-in-cell code for the age of heterogeneous, many-core driven supercomputing. Running from a single source C++ code base PIConGPU supports both "legacy" CPU architectures as well as modern and highly parallel architectures such as OpenPOWER, XeonPHI, and Nvidia GPUs.

Especially the latter enable few-hour turnaround full 3D simulations for complex studies such as laser-ion acceleration. The resulting dramatic demands in post-processing (PBytes+) are efficiently addressed with implemented in-situ data reduction techniques. Those allow asking e.g. for a wide range of observables relevant for experiments - up to 100x during the time frame of an actual beam time. This is complemented by modern methods for photon generation, transport, and X-ray interaction.



Driving, re-using and publishing performance-portable libraries, PIConGPU aims to provide documented, installable and re-usable software components for the community, well suited for open data (openPMD) and open science workflows without restrictions. Latest developments further include a python-centric, extensive framework for specific experiments, which provides all of the above in an intuitive, non-expert user interface.