



Contribution ID: 35

Type: **(b) Poster abstract only (one author must be in person)**

A next generation, integrated community toolset for the modeling of colliders

Thursday 13 June 2024 18:50 (1 minute)

The design of the next generation of colliders demands a renewed, high-performance, integrated set of simulation codes. We present the Beam, pLasma & Accelerator Simulation Toolkit (BLAST), which includes legacy accelerator codes such as Impact-T, Impact-Z, Warp and Posinst, as well as a renewed generation of accelerator codes such as ImpactX, WarpX and HiPACE++. The new codes, born out of the US DOE Exascale Computing Project (ECP), all share a common foundation based on the AMReX library that gives native support for mesh refinement and high performance on both CPU-based and GPU-based computer architectures. The integrated set also includes python-driven workflows for efficient parametric optimization and coupling with machine learning frameworks. We will present the latest of the toolkit and new codes, with discussion on their applications to start-to-end modeling of colliders from the source to the interaction point including beam-beam crossing effects.

Author: VAY, Jean-Luc

Co-authors: FORMENTI, Arianna (LBNL); Dr HUEBL, Axel (Lawrence Berkeley National Laboratory); MITCHELL, Chad; GARTEN, Marco (Lawrence Berkeley National Laboratory); SHAPOVAL, Olga (Lawrence Berkeley National Laboratory); LEHE, Remi (Lawrence Berkeley National Laboratory); SANDBERG, Ryan (Lawrence Berkeley National Laboratory); KAN, Yi-Kai (Lawrence Berkeley National Laboratory); QIANG, ji (Lawrence Berkeley National Laboratory)

Presenter: VAY, Jean-Luc**Session Classification:** Poster session**Track Classification:** FCC accelerators: Accelerator technical design