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ID: 2393 Filling in the Roadmap for Self-Consistent Electron Cloud and Gas Modeling

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Abstract Electron clouds and gas pressure rise limit the performance of many major accelerators. A multi-laboratory effort to understand the underlying physics via the combined application of experiment [1], theory, and simulation is underway. We present here the status of the simulation capability development, based on a merge of the three-dimensional parallel Particle-In-Cell accelerator code WARP and the electron cloud code POSINST, with additional functionalities [2]. The development of the new capability follows a “roadmap” describing the different functional modules, and their inter-relationships, that are ultimately needed to reach self-consistency. Newly developed functionalities include a novel particle mover bridging the time scales between electrons and ions motion [3]. Samples of applications of the new capability to the modeling of intense charge dominated beams [4] and LHC beams [5] will be shown as available.

Footnotes [1] A.W. Molvik, these proceedings.
[2] J.-L. Vay, Proc. "ECLOUD04", Napa (California), 2004.
[3] R.H. Cohen, these proceedings.
[4] P.A. Seidl, these proceedings.
[5] M.A. Furman, these proceedings.

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