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Recent technical improvements to and plans for ArcPIC

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ArcPIC is a 2D electrostatic particle-in-cell code for simulating vacuum arc discharge plasmas.

It is meant to be flexible, making it easy to modify with new surface boundary conditions, external circuits, and more.

ArcPIC was open-sourced 2014, and has since then gone through a technical development and started to be used by a larger community.

Especially, the build system has been rewritten and the output files can optionally be given as HDF5 instead of ASCII.

Furthermore, the arrays for storing the particles and the mesh for the electromagnetic solver was previously defined at compile-time, but is now defined during start-up and re-sized on demand.

Finally, the internal configuration and state data is moved into appropriate classes instead of being stored in the global context.

These improvements aim at making the code faster and more efficient to run, and easier to modify.

Further development is foreseen based on this, especially to restore the checkpoint/restart functionality, capability of handling more particle species, and to implement a parallel/full-wave EM solver.

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