

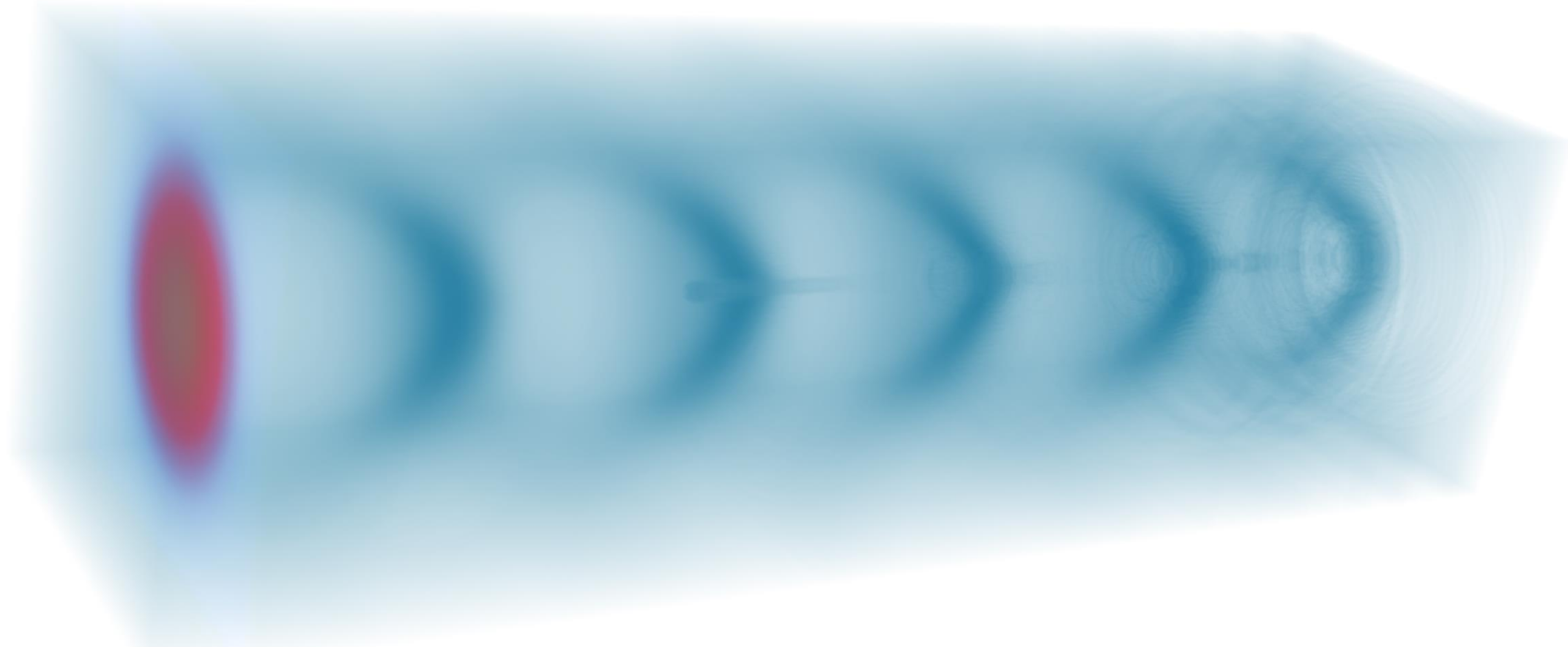
VisualPIC - A New Data Visualizer and Post-Processor for Particle-in-Cell codes.



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3D render of an OSIRIS [1] simulation made with VisualPIC. The laser pulse (red) is moving to the left inside a plasma (blue).

[1] R. Fonseca et al., "OSIRIS: a three-dimensional, fully relativistic particle-in-cell code for modeling plasma based accelerators".

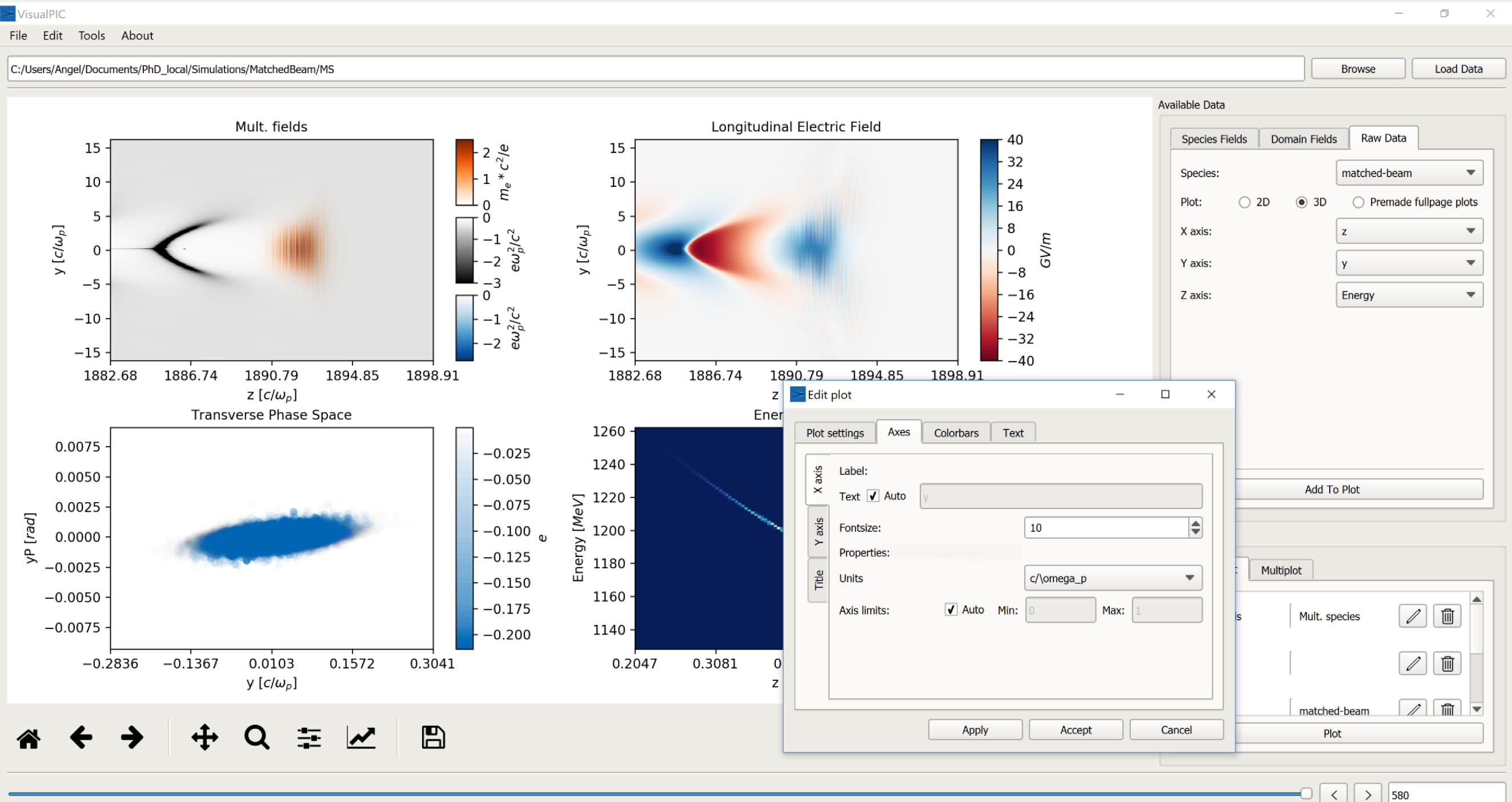


VisualPIC is a new software for data visualization and analysis specifically designed to work with Particle-In-Cell (PIC) simulation codes, mainly for its application in plasma wakefield acceleration.

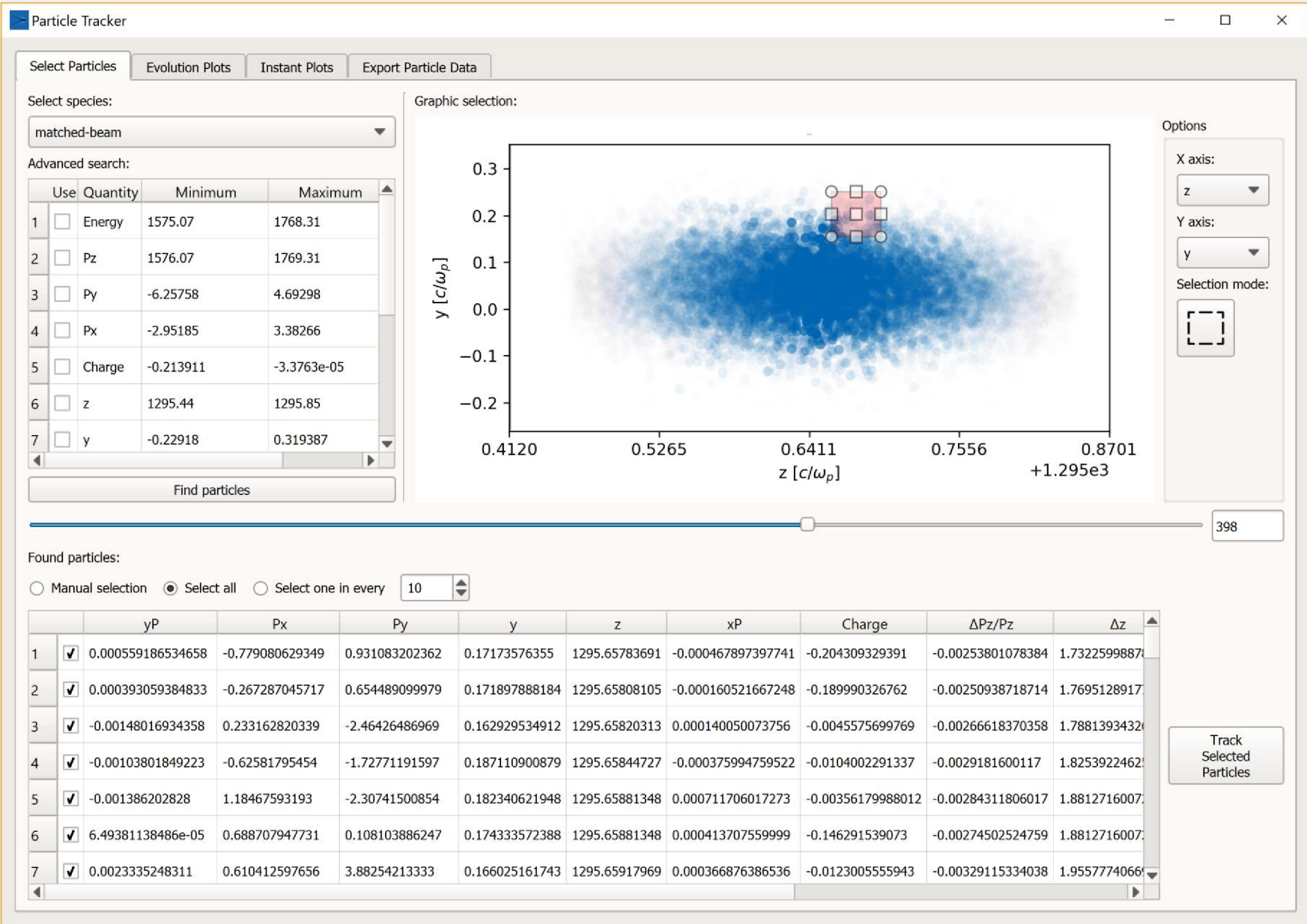
The GUI allows users to easily visualize and interact with the data without needing to do any scripting, making the process very quick and agile.

A User-Friendly Interface for Data Analysis and Visualization

- The data readers scan the simulation folder and populate the GUI with the available data.
- Choose the fields or particle data to plot and easily jump between time steps by using the slider.
- Implemented unit conversion.
- Change colormaps, font size, labels, plot limits, etc.
- Dedicated tool for creating animations.
- Only OSIRIS data is supported at the moment.

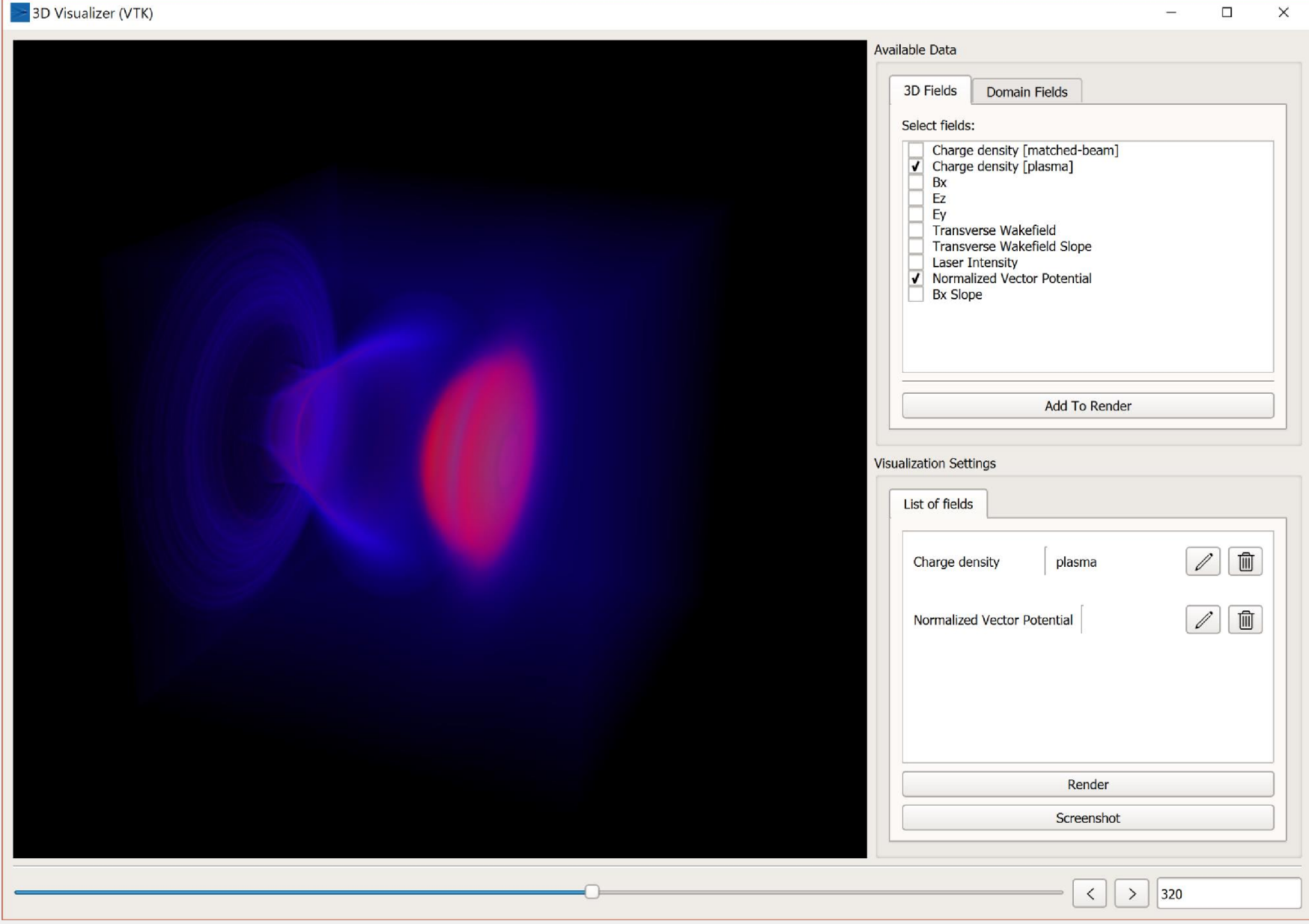


Built-in Particle Tracking



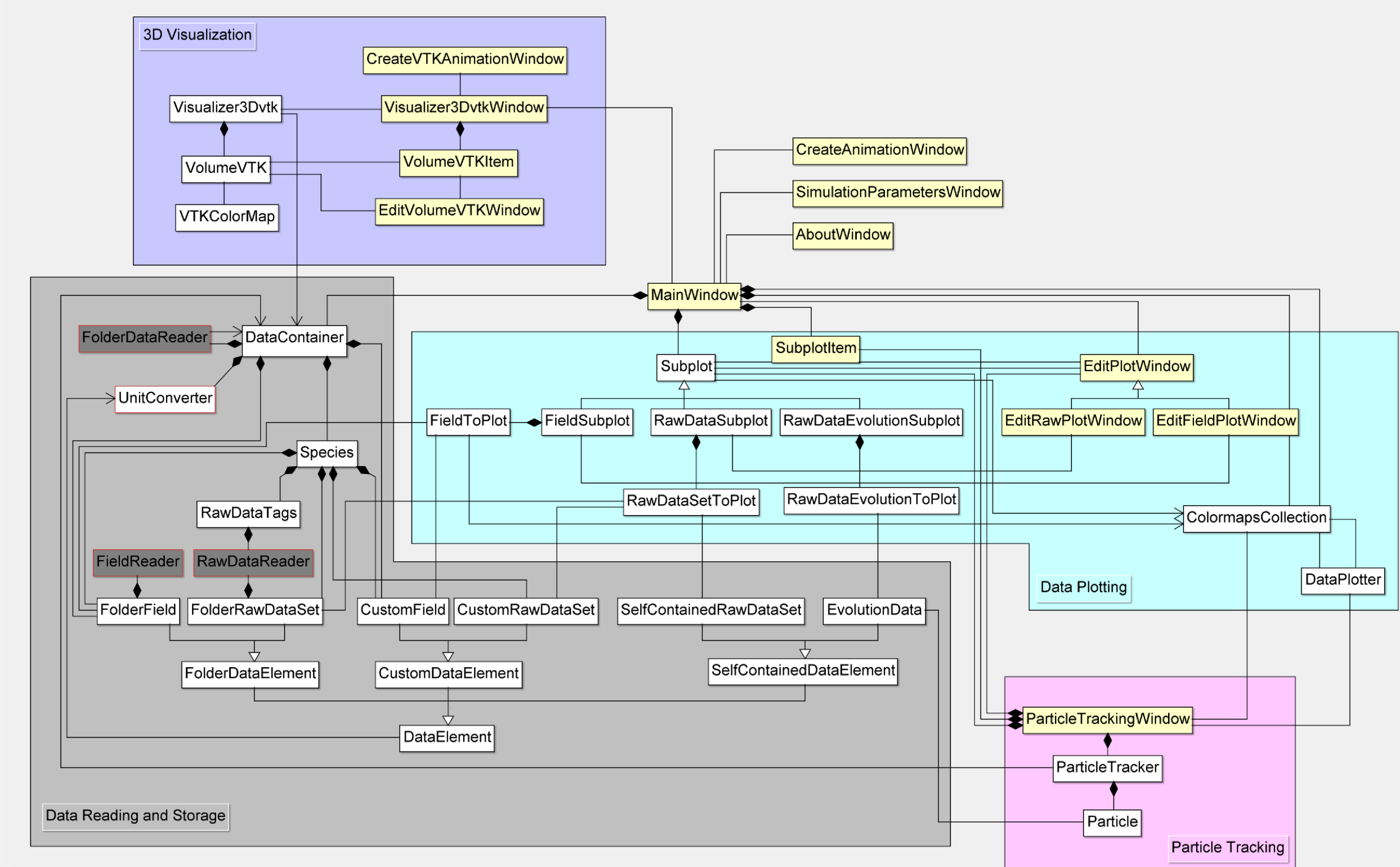
- Tracking is available if the particle data includes tags or labels.
- Select particles graphically or by defining a range.
- Plot tracked data and export in HDF5 format.

Interactive 3D Field Visualization



- Move the camera with your mouse.
- Change visual properties in real time.
- Create screenshots and animations.
- Compatible with 2D and 3D data.
- From 2D data, the 3D fields are reconstructed by assuming cylindrical symmetry.

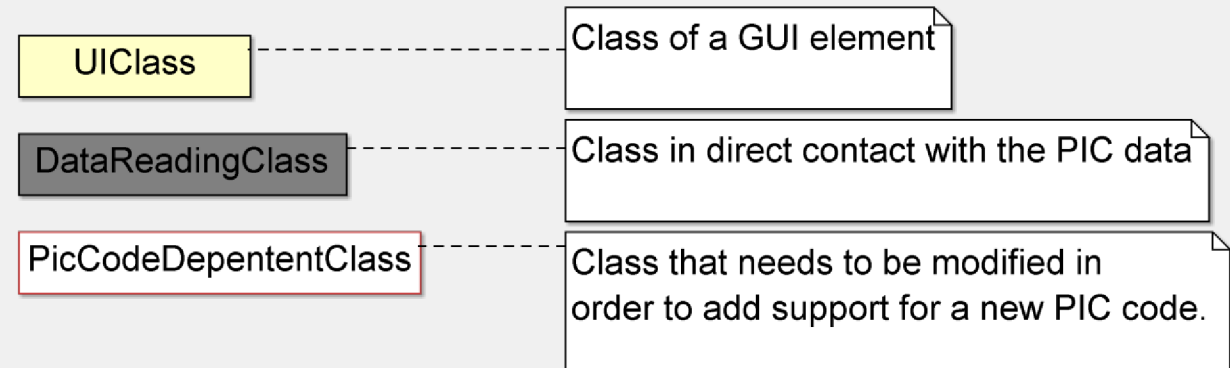
An Open-Source Project Designed For Collaboration



VisualPIC is written in Python 3.5 and uses Qt 5.7 for the interface. All the libraries and dependencies are available in all 3 main operating systems, making it a cross-platform application.

The code is developed following a modular approach, allowing easy addition of new features. For example, in order to add comparability for a new PIC code, only the data readers and the unit converter have to be modified.

The source code is freely available under the GNU GPLv3 license and can be found both on the DESY Stash repository and on GitHub.



Download VisualPIC

DESY Stash:
<https://stash.desy.de/users/ferran/repos/visualpic>

GitHub:
<https://github.com/AngelFP/VisualPIC>

