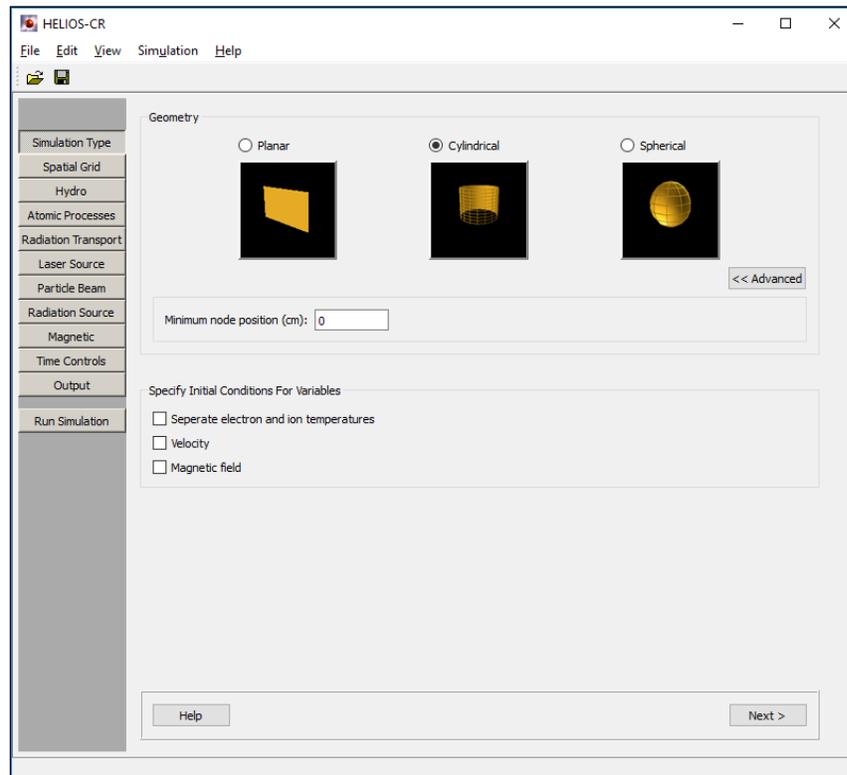




# HELIOS USER'S GUIDE

## Revisions for HELIOS version 7.3.0

- The default EOS was changed from SESAME to PROPACEOS to avoid warnings messages for users that do not utilize SESAME tables.
- Changed defaults for energy and flux of charged particles if electron or ion sources are specified.
- Added check to verify selection of ion species for ion beam model.
- Added checks to verify that users provided tabulated radiation flux data if tabulated radiation BC model was specified.
- On Windows machines, Helios is now correctly installed in 64-bit Program Files folder.
- To better support newer computer hardware, distributions for Windows and Linux are now built with updated compilers and include a new set of dynamic libraries. Average simulation time on Windows machines is reduced by 15%.
- Added capability to specify different initial electron and ion temperatures.
- The first tab (Geometry) was renamed to be "Simulation type". Added controls for requesting non-default initial conditions for electron and ion temperatures, velocities, and magnetic fields models. Relevant fields in "Spatial Grid" tab are only displayed if a corresponding box is checked in Simulation Type. Note that "Magnetic field" control is only enabled in cylindrical geometry.



- Bug fixes:
  - Bug that caused hiding of widgets used to specify materials as DCA materials and setting their composition has been fixed. This occurred when selecting the *File | New* menu item.
  - Fixed fluid velocities to be interpreted as zone-boundary values rather than zone-centered values. This results in one additional velocity index for the whole grid. Note that, in the case of multiple plasma regions, the velocity value at the boundary between regions will acquire the first velocity in the secondary region, as opposed to the last velocity in the first region. Some simulations that used non-uniform initial velocity distributions may produce slightly different results.
  - Fixed bug that prevented simulations with tabulated custom zoning to run in batch mode.
  - Fixed inconsistency in particle energy distribution visualization if all alpha particles in fusion reactions were deposited locally.
  - To prevent repetitive warning messages from progress monitor while a simulation is running, "New region" button was disabled until the simulation is completed.
- *HydroPLOT*:
  - In exo files, spatial distributions of velocities are now correctly displayed.
  - In exo files, spatial distributions of ionization fractions are now correctly displayed for simulations that use the same material in different spatial regions.