

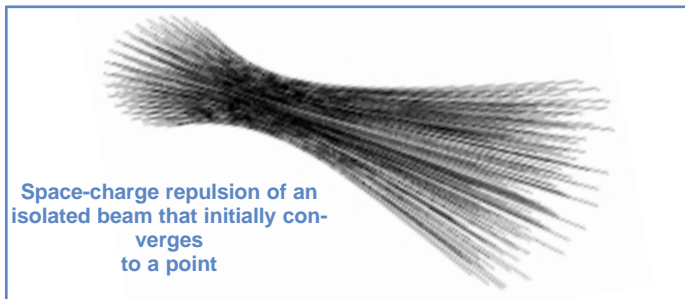
## Advanced electrostatics for space charge, cathodes and high accuracy

*CPO calculates electrostatic/magnetic fields and the trajectories of charged particles through those fields, a bit like SIMION. However, CPO differs fundamentally in its powerful and highly accurate methods of calculation based on the **Boundary Element Method (BEM)**, and it offers well tested space-charge, cathode emission, scattering and other advanced features.*

### Highlights

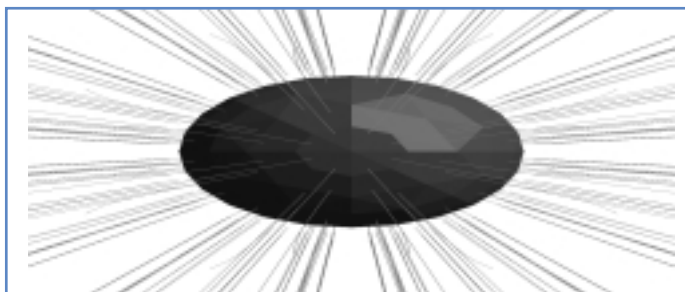
- Extremely accurate BEM methods proven with over 200 benchmark and other examples
- Comprehensive help system supported with examples
- Developed continuously since 1974 by one of the leading research groups in electrostatic systems (University of Manchester, UK)
- Vast range of capabilities and options with advanced underlying algorithms, all at a reasonable price

### Capabilities

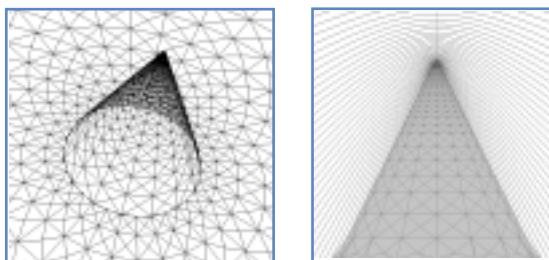


**Particle trajectories are solved**, accounting for **space charge** and relativistic effects (Bulirsch-Stoer ODE solver).

Space charge is handled with iterative convergence tube and mesh methods -- accuracy of 1% against theoretical results have been obtained.



**Cathode emissions limited by space charge** are simulated, including **thermionic, field and extended Schottky emissions**. Supports Child's Law, Langmuir, Fowler-Nordheim and Richardson-Dushman relationships, plus user-defined cathode properties.



**Electrostatic field solving** is done to high accuracy using the **Boundary Element Method (BEM)** rather than traditional FEM or FDM methods. The BEM has unique advantages and is well suited to space-charge, cathode problems and nano-structures in the presence of large electrodes. Adaptive surface meshes get smaller where accuracy is critical. The BEM even easily simulates fine meshes and **non-enclosed** systems. Dielectric version is also available.

<http://www.simion.com/cpo>