Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

Use of the shell model for plasma physics simulation ELISABETTA BOELLA, GoLP/Instituto de Plasmas e Fusao Nuclear, Instituto Superior Tecnico, Lisbon, Portugal and Dipartimento di Energetica, Politecnico di Torino, Italy, GIANNI COPPA, Dipartimento di Energetica, Politecnico di Torino, Turin, Italy, ANTONIO D'ANGOLA, Dipartimento di Ingegneria e Fisica dell'Ambiente, Università della Basilicata, Potenza, Italy, FREDERICO FIÚZA, LUIS O. SILVA, GoLP/Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico, Lisbon, Portugal — In problems of interest for plasma physics with a high degree of symmetry (spherical, cylindrical or planar), a particle-based computational technique can be adopted in which the electric field is calculated without using a spatial grid. As an example, referring to the spherical geometry, the electric field can be calculated assuming that each particle behaves like a "shell" and therefore $E(r)$ is proportional to the sum of the charges qi of the shells with radii $ri<r$. The technique has the double advantage of avoiding the use of a spatial grid and of allowing an infinite radial domain. It has been successfully used to study the expansion of spherical and cylindrical plasmas and to analyze the collision of two slabs of plasma with different densities and temperatures.

Elisabetta Boella
GoLP/Instituto de Plasmas e Fusão Nuclear,
Instituto Superior Técnico, Lisbon, Portugal

Date submitted: 22 Jul 2011 Electronic form version 1.4