PLASMAKIN: A chemical kinetics library for plasma physics modeling NUNO PINHAO, Nuclear and Technological Institute, Phys. Dept. Estrada Nacional 10, 2685 Sacavém, Portugal — PLASMAKIN is a package to handle physical and chemical data used in plasma physics modeling and to compute kinetics data from the reactions taking place in the gas or at the surfaces: particle production and loss rates, photon spectra and energy exchange rates. It has no limits on the number of species and reactions that can be handled, is independent of problem dimensions and can be used in both steady-state and time-dependent problems. A broad range of species properties and reaction types are supported: gas or electron temperature dependent rate coefficients, vibrational and cascade levels, branching ratios, superelastic and other reverse processes, three-body collisions, radiation imprisonment and photoelectric emission. Non-standard rate coefficient functions can be handled by a user-supplied shared library. Reaction data is supplied in text files and is independent of the user's program. Recent additions include the simulation of emission spectra taking line broadening into account; reactions with excited ionic species; 3-body reactions with species with different efficiencies as 3rd body; a species properties database and a Python interface for rapid scripting and debugging.

Nuno Pinhao
Nuclear and Technological Institute, Phys. Dept.
Estrada Nacional 10, 2685 Sacavém, Portugal