Geophysical Research Abstracts, Vol. 8, 03755, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03755

Chemistry in a cometary coma

S. N. Delanoye, J. De Keyser and E. Arijs

Belgian Institute for Space Aeronomy (BIRA - IASB), Brussels, Belgium
(Sofie.Delanoye@bira-iasb.oma.be)

The main goal of the ROSINA instrument (Rosetta Orbiter Spectrometer for Ion and Neutral Analysis) on board of the ESA Rosetta mission is to determine the composition of the volatile material in the coma of a comet. To interpret the future data and to obtain information on the variability of the cometary composition as a function of the distance to the sun and to the nucleus, models of the chemistry in a cometary coma will be necessary. However, programming the chemistry of a cometary coma is extremely complex due to the large number of species and reactions involved. Moreover, such a program needs to be very flexible since it is often necessary to change the species, reactions and reaction rates. Therefore, we have developed software to manage a database of species and reactions and to generate code automatically to compute source/loss balances. The reaction database contains equations for all kinds of reaction types (ion-neutral reactions, photo ionization, electron recombination, Ě) and allows for different expressions of the reaction rates. We present a simple example of a cometary coma simulation based on this software and show how the coma chemistry can be analyzed.