

## **A NEW APPROACH FOR ANALYSIS OF COMPLEX MIXTURES RECOVERED FROM SPACE MISSION : EXAMPLE OF TITAN'S ENVIRONMENT**

M.C. Pietrogrande (1), P. Coll (2) , R. Sternberg (2), C. Szopa (2), R. Navarro-Gonzalez (3), C. Vidal-Majar (4) and F. Dondi (1).

(1) Department of Chemistry, University of Ferrara, 44100 Ferrara, Italy; (2) LISA, UMR CNRS 7583, France ; (3) LQPEP, Instituto de Ciencias Nucleares, UNAM, Mexico ; (4) LRP, CNRS, France.

E-mail : [pcoll@lisa.univ-paris12.fr](mailto:pcoll@lisa.univ-paris12.fr) Fax: +33(1)45171564.

Everything considered, one of the most delicate part of a spatial experiment is definitely the treatment and the interpretation of the results. In spite of the stress of the launch, of the experiment procedure... what do we have to think about the recovered data ?

In the case of planetary atmospheres investigation, a classical analysis is made by gas chromatography. In the case of the Cassini-Huygens mission of exploration of the Saturn system, the coupling of the ACP (Aerosol Collector and Pyrolyser) and GC-MS (Gas Chromatograph Mass Spectrometer) experiments will allow the analysis of the atmospheric aerosols of Titan, the main satellite of Saturn.

We have reproduced in the lab type of signal that will be given by this experiment, using a Pyr-GC-MS and 20 different Titan's aerosol candidates, but with an unique analytical procedure (close to what happen in space, where you can not reach the optimum analysis condition for the separation of the targeted compounds).

We present here a study of these chromatograms based on a statistical approach able to extract from them all the analytical information contained therein and hidden by the complexity of the mixture. In particular, the number of the components really present in the mixture can be correctly estimated as well as a specific order in retention pattern can be singled out and related to the chemical nature of the different products.