Geophysical Research Abstracts
Vol. 16, EGU2014-16039, 2014
EGU General Assembly 2014

High Resolution Mass Spectrometry for future space instrumentation : current development within the French Space Orbitrap Consortium

Christelle Briois (1), Jean-Pierre Lebreton (1), Cyril Szopa (2), Laurent Thirkell (1), Kenzi Aradj (1), Abdel Bouabdellah (2), Amirouche Boukrara (1), Nathalie Carrasco (2), Gilles Chalumeau (1), Olivier Chapelon (1), Fabrice Colin (1), Hervé Cottin (3), Cécile Engrand (4), Noel Grand (3), Alexandre Kukui (1), Cyril Pennanech (3), Roland Thissen (5), Véronique Vuitton (5), Pascal Zapf (3), and Alexander Makarov (6)

(1) LPC2E (CNRS-Universite d'Orleans), Orleans Cedex 2, France (jean-pierre.lebreton@cnrs-orleans.fr), (2) LATMOS, Guyancourt, France, (3) LISA, Université Paris-Créteil, France, (4) CSNSM, Université Paris-Sud, Orsay, France, (5) IPAG, Grenoble, France, (6) Thermo Fisher Scientific (Bremen) GmbH , Germany

Mass spectrometry has been used for years in space exploration to characterise the chemical composition of solar system bodies and their environment. Because of the harsh constraints imposed to the space probe instruments, their mass resolution is quite limited compared to laboratory instruments, sometimes leading to significant limitations in the treatment of the data collected with this type of instrumentation. Future in situ solar system exploration missions would significantly benefit from High Resolution Mass Spectrometry (HRMS). For a few years, 5 French laboratories (LPC2E, IPAG, LATMOS, LISA, CSNSM) involved in the chemical investigation of solar system bodies formed a Consortium to develop HRMS for future space exploration, based on the use of the Orbitrap technology (C. Briois et al., 2014, to be submitted). This development is carried out in the frame of a Research and Technology (R&T) development programme partly funded by the French Space Agency (CNES). The work is undertaken in close collaboration with the Thermo Fisher Scientific Company, which commercialises Orbitrap-based laboratory instruments. The R&T activities are currently concentrating on the core elements of the Orbitrap analyser that are required to reach a sufficient maturity level for allowing design studies of future space instruments. We are indeed pursuing, within international collaborations, the definition of several instrument concepts based on the core elements that are subject of our R&T programme. In this talk, we briefly discuss science applications for future orbitrap-based HRMS space instruments. We highlight present results of our R&T programme.