Geophysical Research Abstracts
Vol. 17, EGU2015-8175, 2015
EGU General Assembly 2015

Early Observations with the Rosetta/MIRO Instrument at comet 67P/Churyumov-Gerasimenko

Samuel Gulkis (1) and the MIRO Science Team

(1) Jet Propulsion Laboratory, California Institute of Technology, Astrophysics and Space Sciences, Pasadena, CA, United States., (2) LERMA, Observatoire de Paris, PSL Research University, UPMC Univ. Paris 06, CNRS, UMR8112, F-75014, Paris, France. , (3) LESIA-Observatoire de Paris, CNRS, UPMC, Université Paris-Diderot, Meudon, France. , (4) Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden. , (5) Max-Planck-Institut für Sonnensystemforschung, Göttingen, Germany. , (6) National Central University, Jhongli, Taiwan. , (7) University of Massachusetts, Amherst, MA, USA.

The MIRO (Microwave Instrument on the Rosetta Orbiter) is a dual frequency (560 GHz and 190 GHz) heterodyne instrument consisting of two broadband channels (one in each frequency band) for continuum measurements, and a very high spectral resolution (44 kHz, 4096 channels) spectrometer interfaced with the submillimeter radiometer. Broad scientific objectives are to understand heat transport and ice sublimation in comets as interrelated processes reflecting properties acquired at time of formation and subsequent evolution and to understand important processes in the coma.

The spectroscopic receiver is fixed tuned to measure simultaneously 8 molecular transitions of water, carbon monoxide, ammonia, and methanol. The continuum channels probe the nucleus sub-surface temperatures; the spectrometer channels are sensitive to gas abundance, velocity, and temperature. This paper will present an overview of the MIRO instrument, status of observations, and early results. Early results include detection and monitoring of water vapor in the coma, measurements of water gas production rates and their temporal and spatial variability, and measurements of subsurface temperatures and temperature gradients in the nucleus at depths of a few centimeters.

The authors acknowledge funding support from NASA, CNES and CNRS/INSU, National Central University, and SNSB (Sweden). A part of this work was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration. We thank the operational support teams from the ESA Rosetta Mission.