Geophysical Research Abstracts
Vol. 14, EGU2012-5031, 2012
EGU General Assembly 2012

Planetary Seismometers: An Overview

M. Knapmeyer (1), A. Akito (2), G. Bampasidis (3,4), W.B. Banerdt (5), A. Coustenis (4), M.J. Fouch (6), E.J. Garnero (7), O. Khavroshkin (8), N. Kobayashi (9), X. Moussas (3), W.T. Pike (10), K.J. Seidensticker (11), A. Solomonidou (3,4), H. Yu (7), and A. Zakharov (12)

(1) DLR, Institut of Planetary Research, Berlin, Germany (martin.knapmeyer@dlr.de), (2) Earthquake Research Institute, Tokyo, Japan, (3) National and Kapodistrian University of Athens, Faculty of Physics, Athens, Greece , (4) Observatoire de Paris, LESIA, Meudon, France, (5) Jet Propulsion Laboratory, Pasadena, CA, USA, (6) Carnegie Institution of Washington; Washington, USA, (7) Arizona State University, Tempe, AZ, USA, (8) Schmidt Institute of Physics of the Earth, Moscow, Russia, (9) JAXA/ISAS, Sagamihara, Japan, (10) Imperial College, London, UK, (11) DLR, Institute of Planetary Research; Cologne, Germany, (12) Space Research Institute; Moscow, Russia

Seismometers were part of lander payloads since the launch of Ranger 3 in early 1962, which was the first attempt to deliver scientific instruments to the surface of another celestial body. Since then, active and passive seismic experiments were conducted with great success on the Moon, and to a lesser extent on Mars and Venus. Proposals have been made or are in preparation for new experiments with single instruments or instrument networks on Venus, Moon, Mars, Phobos, Titan, Europa, and other bodies. One instrument (CASSE, sensitive for acoustic frequencies >= 30Hz) is currently flying to comet 67P/Churyumov-Gerasimenko on board of the Rosetta Mission.

We give an overview of seismometers for use in planetary missions, including instruments of past and future missions. The focus is on the current developments as represented by the authors of the presentation. These encompass a Micro-Electromechanic System, several piezoelectric transducers that are able to resist strong decelerations, as well as new developments based on laser-interferometric sensing or hydrodynamic flow of electrolytic liquids.