EPSC Abstracts
Vol. 7 EPSC2012-221 2012
European Planetary Science Congress 2012
© Author(s) 2012

One–off in situ measurements and *a posteriori* data reduction — what can we learn about optimal experiment design?

A. Hagermann
The Open Univesity Department of Physical Sciences, CEPSAR, Milton Keynes, UK (a.hagermann@open.ac.uk)

Abstract

One of the characteristics of many planetary in situ measurements is their bespoke design, sometimes without sufficient a priori knowledge. Thus, a lack of accuracy has to be compensated by taking special care in data processing. Using data from the Cassini–Huygens in situ experiment SSP [1], some data reduction methods used (e.g. [2]) are reviewed. The methods applied demonstrate how rigorous use of a posteriori information can result in more meaningful models. However, they also indicate areas where a posteriori processing cannot make up for appropriate experiment design. These examples used can serve as a starting point for a rigorous design strategy for in situ experiments.

References

[1] Zarnecki, J.C., Leese, M.R., Hathi, B., Ball, A.J., Hagermann, A., Towner, M.C., Lorenz, R.D., McDonnel1, J.A.M., Green, S.F., Patel, M.R., Ringrose, T.J., Rosenberg, P.D., Atkinson, K.R., Paton, M.D., Banaszkiewicz, M., Clark, B.C., Ferri, F., Fulchignoni, M., Ghafoor, N.A.L., Kargl, G., Svedhem, H., Delderfield, J., Grande, M., Parker, D.J., Challenor, P.G., and Geake, J.E.: A soft solid surface on Titan at the Huygens landing site as measured by the Surface Science Package (SSP). Nature 438 (7069), 792-795, 2005.

[2] Hagermann, A., Rosenberg, P.D., Towner M.C., Garry, J.R.C., Svedhem, H., Leese, M.R., Hathi, B., Lorenz, R.D., and Zarnecki, J.C.: Speed of sound measurements and the methane abundance in Titan's atmosphere. Icarus 189, 538-543, 2007.