EPSC Abstracts,
Vol. 4, EPSC2009-497, 2009
European Planetary Science Congress,

Ground-based study of Saturn lightning discharges

J.-M. Grießmeier (1), P. Zarka (2), A. Konovalenko (3), G. Fischer (4), B. Ryabov (3), D. Vavriv (3), V. Ryabov (5), H. Rucker (4), P. Ravier (6), M. Sidorchuk (3) and the Radio-Exopla collaboration (*)

(1) ASTRON, Dwingeloo, The Netherlands, (2) LESIA, CNRS-Observatoire de Paris, Meudon, France, (3) Institute of Radio Astronomy, Kharkov, Ukraine, (4) Space Research Institute, Graz, Austria, (5) Complex Systems Department, Future University, Hakodate, Hokkaido, Japan, (6) Institut Prisme, Université d'Orléans, France, (*) B. Cecconi, A. Coffre, L. Denis, C. Fabrice, J.-M. Grießmeier, A. Konovalenko, R. Kozhyn, D. Mukha, L. Pallier, P. Ravier, H. Rucker, B. Ryabov, V. Ryabov, J. Schneider, V. Shevcenko, M. Sidorchuk, D. Vavriv, V. Vinogradov, R. Weber, V. Zakharenko, P. Zarka

Abstract

In the past, lightning-generated radio emission from Saturn was only observable by satellite missions (Voyager 1 in 1980, Voyager 2 in 1981, and Cassini since 2004). Since 2006, ground-based observations became available as a complementary source of information. Using a new broadband receiver at UTR-2 (Ukraine), Saturn lightning was detected over the whole spectral range of the instrument (10-30 MHz) in December 2007 and January 2008. For the first time, this allowed to study the instantaneous spectrum of the discharge, and the temporal fine structure of the emission could be studied with a temporal resolution surpassing that of regular satellite observations. We will discuss the relevance of the "e-folding time" for describing the distribution of the duration of individual discharges, and compare average spectra to those from previous observations. The complementarity of ground-based and space-borne observations is discussed, and future observation plans are presented.