



**HAL**  
open science

## Longitudinal dependence of VLF electromagnetic emissions observed by the Van Allen Probes and the DEMETER spacecraft

Jan Zaslava, František Němec, Ondřej Santolík, Ivana Kolmašová, George B. Hospodarsky, Michel Parrot, William S. Kurth, Craig Kletzing

► **To cite this version:**

Jan Zaslava, František Němec, Ondřej Santolík, Ivana Kolmašová, George B. Hospodarsky, et al.. Longitudinal dependence of VLF electromagnetic emissions observed by the Van Allen Probes and the DEMETER spacecraft. 19th EGU General Assembly, Apr 2017, Vienne, Austria. pp.3274. insu-03568154

**HAL Id: insu-03568154**

**<https://insu.hal.science/insu-03568154>**

Submitted on 12 Feb 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



## **Longitudinal dependence of VLF electromagnetic emissions observed by the Van Allen Probes and the DEMETER spacecraft**

Jan Zhlava (1), František Němec (1), Ondřej Santolík (2,1), Ivana Kolmašová (2,1), George B. Hospodarsky (3), Michel Parrot (4), William S. Kurth (3), and Craig Kletzing (3)

(1) Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic, (2) Institute of Atmospheric Physics, Czech Academy of Sciences, Prague, Czech Republic, (3) Department of Physics and Astronomy, University of Iowa, Iowa City, IA, USA, (4) LPC2E/CNRS, Orleans, France

We use electromagnetic wave data obtained by the Van Allen Probes (2012–2016) to investigate longitudinal dependencies of average wave intensities in the very low frequency range. We calculate the dependencies for various frequency bands and magnetic local times. The main interest is to analyze the local time intervals about 10:30 LT and 22:30 LT in order to enable a comparison with the measurements performed by the DEMETER spacecraft (2004–2010) at low altitudes ( $\approx 700$  km). Additional wave parameters which are available in the Van Allen Probes data set, e.g. directions of the wave propagation, are also considered. We attempt to evaluate the contribution of the lightning-generated whistlers to the overall wave intensity. The main idea of the performed analysis is that emissions generated in the magnetosphere should not depend on the geomagnetic longitude, i.e., any observed longitudinal dependence of the wave intensity should be of the terrestrial origin and possibly linkable to the lightning activity. The obtained results may have a potential impact on identifying the source of plasmaspheric hiss.