



HAL
open science

Evaluating the effects of lightning-generated whistlers observed by the DEMETER spacecraft

Jan Zahlava, Frantisek Nemeč, Jean-Louis Pincon, Ondrej Santolik, Ivana
Kolmasova, Michel Parrot

► **To cite this version:**

Jan Zahlava, Frantisek Nemeč, Jean-Louis Pincon, Ondrej Santolik, Ivana Kolmasova, et al.. Evaluating the effects of lightning-generated whistlers observed by the DEMETER spacecraft. EGU General Assembly 2016, Apr 2016, Vienne, United States. insu-03573539

HAL Id: insu-03573539

<https://hal-insu.archives-ouvertes.fr/insu-03573539>

Submitted on 15 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



Evaluating the effects of lightning-generated whistlers observed by the DEMETER spacecraft

Jan Zhlava (1), Frantisek Nemecek (1), Jean-Louis Pincon (2), Ondrej Santolik (3,1), Ivana Kolmasova (3,1), and Michel Parrot (2)

(1) Faculty of Mathematics and Physics, Charles University in Prague, Prague, Czech Republic, (2) LPC2E/CNRS, Orleans, France, (3) Institute of Atmospheric Physics, Czech Academy of Sciences, Prague, Czech Republic

Although lightning-generated whistlers have been studied for nearly a century, there are still questions to be answered. It is clear that, at least in a certain frequency range, these waves significantly contribute to the overall wave intensity in the inner magnetosphere. They also influence distribution functions of energetic particles in the van Allen radiation belts. Due to the on board implemented neural network for automated whistler detection, the data set obtained by the low-altitude DEMETER spacecraft allows us to relate measured electromagnetic wave data and energetic particle flux with the number and dispersion of whistlers detected during a certain time interval. We distinguish the cases with high and low whistler occurrence and we use this information to determine the overall effect of lightning-generated whistlers.