



# Evaluating the influence of lightning generated whistlers on the overall VLF wave intensity detected by a low-altitude spacecraft

Jan Zahlava, Frantisek Nemec, Ondrej Santolik, Ivana Kolmasova, Michel Parrot

## ► To cite this version:

Jan Zahlava, Frantisek Nemec, Ondrej Santolik, Ivana Kolmasova, Michel Parrot. Evaluating the influence of lightning generated whistlers on the overall VLF wave intensity detected by a low-altitude spacecraft. 20th EGU General Assembly, Apr 2018, Vienne, Austria. pp.4834. insu-03566336

HAL Id: insu-03566336

<https://insu.hal.science/insu-03566336>

Submitted on 11 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 influence of lightning generated whistlers on the overall VLF wave intensity detected by a low-altitude spacecraft

Jan Zahlava (1), Frantisek Nemec (1), Ondrej Santolik (2,1), Ivana Kolmasova (2,1), and Michel Parrot (3)

(1) Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic ([jan.zahlava@centrum.cz](mailto:jan.zahlava@centrum.cz)), (2) Institute of Atmospheric Physics, Czech Academy of Sciences, Prague, Czech Republic, (3) LPC2E/CNRS, Orléans, France

The influence of lightning generated whistlers on the overall very low frequency (VLF) wave intensity in the Earth's inner magnetosphere is still a subject of discussion. We combine lightning location data and VLF wave intensity measured by a low altitude spacecraft to identify frequency-location intervals where this influence is significant. The World Wide Lightning Location Network (WWLLN) provides a unique data set of times and locations of lightning strokes all around the world. When combined with the wave measurements performed by the DEMETER spacecraft (Sun-synchronous polar orbit, altitude of about 700 km), it allows us to calculate average/median power spectral densities of electric field fluctuations in the frequency range up to 20 kHz distinguished according to the lightning activity level. A comparison of the dependencies obtained for low and high lightning activity levels is then used to determine the influence of lightning generated whistlers. The obtained results are discussed in the frame of a possible relation to the plasmaspheric hiss generation.