WHISTLER-MODE CHORUS WAVE-NORMAL DISTRIBUTION EFFECTS FOR AND ELECTRON SCATTERING IN THE RADIATION BELTS

Oleksiy Agapitov
LPC2E/CNRS University of Orleans, Orleans, France;
National Taras Shevchenko University of Kiev, Kiev, Ukraine
.oleksiy.agapitov@gmail.com

A. Artemyev
LPC2E/CNRS University of Orleans, Orleans, France;
Space Research Institute,RAS, Moscow, Russia

H. Breuillard, V. Krasnoselskikh
LPC2E/CNRS University of Orleans, Orleans, France;

G. Rolland
CNES, Toulouse, France

Keywords: Cluster measurements, dynamics of the radiation belts.

Abstract: VLF waves play a crucial role in the dynamics of radiation belts, and are responsible for the loss and the acceleration of energetic electrons. Modeling wave-particle interactions requires the best possible knowledge of wave energy and wave-normal directions in L-shells for different magnetic latitudes and magnetic activity conditions. In this work, we performed a statistical study for VLF emissions using a whistler frequency range for ten years (2001-2010) of Cluster measurements. We performed a statistical study for VLF emissions using a whistler frequency range for ten years (2001-2010) of Cluster measurements. We utilized data from the STAFF-SA experiment, which spans the frequency range from 8.8 Hz to 3.56 kHz and present distributions of wave magnetic and electric field amplitude and wave-normals in dependence on MLat, MLT, L-shell and geomagnetic activity in a form of probability levels, which were directly applied for electrons diffusion coefficients estimation in the outer radiation belt. The propagation direction of chorus waves rapidly deflects from the magnetic field with the increase of latitude. The width of the distribution increases also. Results were proved by use of numerical ray tracing simulation. Distributions for the diffusion coefficients for day and night sectors and for different geomagnetic activity regimes are obtained. The diffusion coefficients from these distributions are compared with coefficients calculated under assumption of whistler parallel propagation with constant value of variance and wave amplitude along magnetic field line. The increase of the mean value and the variance of the wave vector.

Artemyev A., Krasnoselskikh V., Breuillard H., Rolland G. and Agapitov O..
WHISTLER-MODE CHORUS WAVE-NORMAL DISTRIBUTION EFFECTS FOR AND ELECTRON SCATTERING IN THE RADIATION BELT.
DOI: 10.5220/0005415701870187
In *Proceedings of the First International Conference on Telecommunications and Remote Sensing* (-2012), pages 187-187
ISBN: