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Statistical study of the propagation characteristics of ELF hiss observed on GEOS-1, inside and outside the plasmasphere

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#### ABSTRACT

Statistical studies were performed of the propagation characteristics of dayside ELF hiss, observed inside and outside the plasmasphere, by the GEOS-1 satellite. The directions of propagation are characterized by the polar angle  $\theta$  made by the  $\mathbf{k}$  vector with  $\mathbf{B}_0$ , and by the azimuthal angle  $\phi$ . They are obtained by estimating the first moments of the wave distribution functions (WDF). In about 64% of the cases, the distinction is made between upgoing and downcoming waves. Inside the plasmasphere, the distribution in  $\theta$ ,  $\phi$  angles and the ratio of downcoming to upgoing waves show that the source regions are located near the equator. Oblique waves reaching the equatorial region seem to be transformed into small  $\theta$  waves, uniformly distributed in  $\phi$ . Outside the plasmasphere, ELF hiss is commonly associated with irregularities in electron density. The propagation characteristics are consistent with source regions both near the equatorial region (smallest frequencies) and at geomagnetic latitudes  $\geq 40^\circ$  (highest frequencies).

*This paper can purchased at the following site, where there is also a short abstract in French: <http://cat.inist.fr/?aModele=afficheN&cpsidt=7875630>*