

MLR and particles observed by DEMETER: a love affair ?

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Magnetospheric Line Radiation (MLR) are commonly observed onboard the low altitude satellite DEMETER. These electromagnetic waves appear in a frequency range between 1 and 8 kHz as a set of lines more or less drifting in frequency. The frequency spacing between the lines could vary between 50 and 150 Hz. The origin of these emissions is still unknown although there are attempts to attribute them to Power Line Harmonic Radiation. On the other hand, DEMETER observed energetic particle spectrograms where energy striations appear. The particle energy range of these striations is between 70 and several hundred keV and they mainly appear at low L values. In this paper we will show that there is a possibility that these energy striations of the particles are due to the MLR. Both are observed during periods of moderate and large magnetic activity. It exists events where MLR and particle striations are simultaneously observed but there are also cases where striations are observed on a given orbit and MLR are observed later, i.e. on an orbit located westward. In these later cases, it means that, when we only observed striations, the equatorial cyclotron resonance interaction is already done and we observe the results eastward due to the drift of the particles. The time duration of the MLR events, the time drift of the particles and the cyclotron resonance mechanism are considered to evaluate the possibility of particle energy striations by MLR. The other possibilities to explain these striations are the interaction with the VLF ground-based transmitter waves and instabilities in the longitudinal drift of the particles.