

Magnetospheric Line Radiation: A systematic study using DEMETER spacecraft

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We present results of a systematic survey of Magnetospheric Line Radiation (MLR) observed since the beginning of the DEMETER mission. DEMETER is a French micro-satellite (launched in June, 2004, altitude of orbit about 700 km) designed to study electromagnetic phenomena connected with seismic or man-made activity.

An automatic identification procedure of possible MLR events has been developed and used in order to obtain a statistically significant data set. We show that there are two principally different classes of events: 1) events with the spacing of 50/100 or 60/120 Hz (so-called Power Line Harmonic Radiation, PLHR) 2) events with other spacing. While the first class of events originates from power systems on the Earth's surface and the frequency spacing well corresponds to the fundamental frequency of the radiating power system, the second class is most probably generated in a completely natural way.

All the events are thoroughly analyzed using both statistical (tens of cases have been found) and case-study approach (especially for low frequencies when all the six components of electromagnetic field are measured).