



Remote sensing of the Earth's ionosphere perturbations using very low frequency transmitters

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We report on electric field measurements recorded by DEMETER/ICE experiment above very low frequency (VLF) transmitter stations. The sun-synchronous orbits of the DEMETER satellite lead us to cover an invariant latitude range between -65° and $+65^{\circ}$ in a time interval of about 40 minutes. We select three ground-based transmitter stations localised in Australia (NWC, 19.8 kHz), in Germany (DFY, 16.58 kHz) and in Japan (JP, 17.8 kHz). We analyse the complete set of data recorded from August 2004 to December 2010. We distinguish between the VLF signals observed when the satellite was on day- or night-sides of the Earth at about 22 LT and 10 LT, respectively. We characterize the reception condition of the VLF signal taking into consideration the satellite position above the transmitter stations. We find that the signal amplitude is increasing (up to a maximum) and decreasing (down to a minimum) in a time interval of about 12 days. This 'regular' reception of the VLF signal is a signature of quiet ionosphere behaviour above the transmitter stations. We discuss in our contribution about the time intervals where the VLF signals were almost not detected. The origins of the signal attenuation seem to be linked to the ionospheric perturbations due to the solar activity, the earthquake occurrences and the geomagnetic activity.