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VLF MONITORING SYSTEM FOR CHARACTERIZING THE LOWER LAYER IONOSPHERIC
REGION**Abstract**

International Heliophysical Year (IHY; 2007-2009) has a remarkable impact to the space and earth electromagnetism research and society. For Malaysian perspectives, it acts as a spiral point to the expanding of space weather-related researchers. The research activities involve installation of real-time Very Low Frequency (VLF) receiver for space weather study and application. VLF (3 –30 kHz) normally used for long distance communication which use lower ionospheric layer as reflection medium during long wave propagation (S. N. A. Ahmadet.al.,2015). The variation of this layer due to space weather events influences the performance of received signal at the receiver stations (M. IndiraDeviet.al., 2008 and T.Affah et.al.,2016). The observation of VLF signal will determine the enhancement of electron density due to space weather. The electron density are characterised by two main parameters which are (sharpness factor) and H (reference height). In this research, several types of VLF antennas have been developed to monitor the variation of amplitude signal within these frequency ranges. To date, the developed VLF receiver system in Malaysia located at UPSI, UKM and ANGKASA-Banting are able to capture the transmitted signal from several VLF transmitter located at NWC (North West Cape, Australia / 19.8kHz), JJI (Ebino, Japan/ 22.2kHz) and VTX (Katabomman, India)/ 18.2kHz). All the receiver stations require good maintenance mechanisms to ensure all the equipment at the site stations are working and sending their real-time data to the dedicated server (Nur Ain Zakariaet.al.,2017). The parallel data transmission system has been developed to transfer data from VLF receiver system to the computer and as well as transfer data between computer and remote server. This system integrates interaction between VLF receiver equipment and embedded systems which open many distributed networks of devices that can be communicated for data transferring. This project is also to explore the possibilities to provide open access data to all interested research communities in the spirit to stimulate the human capital development in the area of Space and Earth Electromagnetism.