**Geomagnetic field observations at a new Antarctic site, within the AIMNet project**

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**ABSTRACT**

During the 2007-2008 Antarctic campaign, the Italian PNRA installed a Low Power Magnetometer within the framework of the AIMNet (Antarctic International Magnetometer Network) project, proposed and coordinated by BAS. The magnetometer is situated at Talos Dome, around 300 km from Mario Zucchelli Station (MZS), and approximately at the same geomagnetic latitude as MZS. In this work we present a preliminary analysis of the geomagnetic field 1-min data, and a comparison with simultaneous data from different Antarctic stations.

**INTRODUCTION**

In this study we analyze a preliminary analysis of geomagnetic field data recorded at Talos Dome (TLD) from 16 January to 14 March 2008. The magnetometer is part of the Antarctic Integrated Magnetometer network (AIMNet) that operates the INTERMAGNET observatory SBA. The stations TLD and SBA are run by INGV; SBA data, run by GANIL, NZ, are provided by INTERMAGNET database.

**DIURNAL VARIATION**

On the right the hourly values of the horizontal H (northward) and D (eastward) component variations are shown for each station. The presentation of these results allows to study a sustained deviation from the diurnal variation, which appears as a sharp increase in the horizontal field at approximately 08 UT at TLD. This feature indicates an increasing amplitude of the geomagnetic field at TLD.

**SINGLE EVENTS**

The event occurring on 22 February, 2008, marks the activity of a new magnetic storm. The power spectra show a sharp increase in the power peak in the frequency range of 24 hr period. Sometimes also a 12 hr peak emerges.

**TLD GEOMAGNETIC FIELD DATA**

The data show the installation of the LPM magnetometer at TLD during the 2007-2008 Antarctic campaign. The system, with rechargeable batteries powered by a solar panel and a wind generator, has minimal power requirements.

**AVERAGE COHERENCE AND POWER SPECTRA**

The average coherence of the horizontal H component at TLD is greater. The coherence is higher for the three stations TLD-TLD, which are a bit closer from TLD than SBA-TLD (Table 1). During the day, the coherence is higher for the MLT right sector (0-12 UT), when the stations are well within the polar cap, far from the apoapsis, and also just before MLT noon (12-21 UT). The coherence generally decreases for increasing frequency, especially in the first sector.

**EXAMPLES OF DAILY MAGNETIC STORMS AT SBA, TLD, AND TNL**

It is evident that the observations at the three stations are very similar, although some differences can be found.

**EQUIVALENT COHERENCE**

The arrows indicate the MLT noon at the three stations.

**AVG. COHERENCE**

The average coherence of the horizontal H component at TLD is shown. The arrows indicate the MLT noon at the three stations.

**ZUCCHELLI TLD GEOMAGNETIC FIELD DATA**

The pictures show the installation of the LPM magnetometer at TLD during the 2007-2008 Antarctic campaign. The system, with rechargeable batteries powered by a solar panel and a wind generator, has minimal power requirements.

**TLD DATASET CONSISTS OF 1 MIN AVERAGES FROM 1-SEC ORIGINAL SAMPLING RATE OF THE THREE GEOMAGNETIC FIELD COMPONENTS H, D, AND Z FROM 1 TO 21 MARCH 2008**

The TLD dataset consists of 1 min averages, from 1-sec original sampling rate, of the three geomagnetic field components H, D, and Z from 10 January to 14 March 2008.

**AVERAGE DYNAMIC POWER SPECTRA AT THE THREE STATIONS**

The average dynamic power spectra at the three stations are shown. The arrows indicate the MLT noon at the three stations.

**TLD GEOMAGNETIC FIELD DATA**

The TLD dataset consists of 1 min averages, from 1-sec original sampling rate, of the three geomagnetic field components H, D, and Z from 10 January to 14 March 2008.