The Magnetic Observatory of Coimbra (COI): operating status and future developments

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The Magnetic Observatory of Coimbra (COI) was founded in 1864. Currently operated by the Geophysical and Astronomical Observatory of the University of Coimbra, it is one of the oldest observatories in operation in the world and the only one in Portugal mainland. Besides giving a brief account of its long history, instruments and routines, this presentation aimed to characterize the geomagnetic series currently observed in COI, and to present its master plans for future development.

The Magnetic Observatory of Coimbra (COI) was founded in 1864 (Fig. 1). Currently operated by the Geophysical and Astronomical Observatory of University of Coimbra, is one of the oldest observatories in operation in the world and the only one in Portugal mainland. Due to the increasing urbanization during the first quarter of the 20th century, the observatory was relocated to its current site (*Alto da Baleia*) in 1932. The first years in *Alto da Baleia* suffered from very flawed operation and all observations ended up being interrupted around 1941 due to the difficult years of World War. Magnetic observatory routines were resumed nearly the end of 1951 on a methodical and more accurate basis (Pais and Miranda, 1995).

By the late 1980s, the COI data began showing again some non-negligible perturbations mainly related to the aging and drift of instruments. Part of these problems and limitations were overcome in 2007 by replacing the complete old set of instruments with a modern digital fluxgate variometer (a DMI model FGE, suspended version) and a standard pair of absolute instruments (a DI-flux based on a Bartington fluxgate MAG01H sensor mounted on a MG2KP Theodolite and an Overhauser GSM-90F1 scalar magnetometer). This upgrading resulted in a healthier base-line stability and in a clear quality improvement of the monthly and annual data series as demonstrated by the lowering variance of their first time-differences (Morozova et al., 2014). Nonetheless, the ongoing city growth continued to critically threaten the good functioning and quality of observatory data, in particular the high frequency signal. This can be a limitation for some space weather studies.

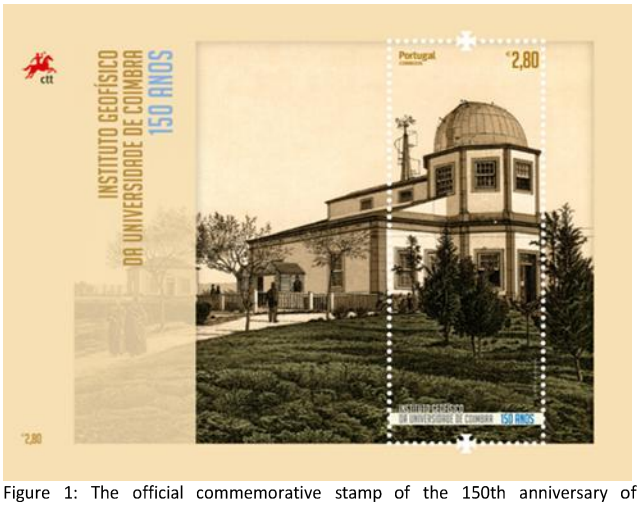

Figure 1: The official commemorative stamp of the 150th anniversary of foundation of the Meteorological and Magnetic Observatory of the University of Coimbra (MMOUC): old drawing of the MMOUC's main building; issued in 2014 by *Correios de Portugal* (CTT).

Besides giving a brief account of its long history, instruments and routines, this presentation aimed to characterize the geomagnetic series currently observed in COI (available at the WDC for Geomagnetism, Edinburgh), and to present its master plans for future development, which will comprise the relocation of the observatory to a rural area near Coimbra, and the application to integrate the INTERMAGNET network.

References:

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