

## **IMPORTANCE OF GEOMAGNETIC DATA AND THE ROLE OF WDC-MUMBAI IN SOLAR TERRESTRIAL RESEARCH**

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The manifestation and development of magnetic storm is closely related to the interaction of solar wind and magnetosphere following the reconnection processes of interplanetary magnetic field with the earth's magnetic field boundary. In the history of geomagnetism, geoelectricity, and space science, the use of ground magnetic records has demonstrated to be a powerful tool for monitoring the levels of overall geomagnetic activity. Different indices such as Dst, Kp, and Ap were proposed to express different aspects of geomagnetic field variations. The geomagnetic records from Colaba-Alibag observatories in India contain historically the longest and continuous observations recorded on photographic paper since 1872 to the present day digital data using modern magnetometers. Some of the super intense space weather events are investigated using old preserved historical records of Colaba, India. A historical reference is Carrington (1859), who witnessed the largest registered geomagnetic storm and related it to a white-light flare in the Sun from a very large active region, as seen in the photosphere, is observed in Colaba, India records and is well investigated (Tsurutani et al., 2003). The period of October and November 2003 witnessed major magnetic storm events in the present solar cycle. Solar region 486 produced one of the largest solar flares of this solar cycle, an X17/4B proton flare peaking and had intense radio bursts. A very fast earth ward directed full halo Coronal Mass Ejection (CME) was observed. This powerful CME produced an intense magnetic storm on 29 October. Varied development pattern during the storm main phase for the events of 29 October, 30 October and 19 November of 2003, major events of solar cycle 23 and 24 are studied using ground geomagnetic data with one minute resolution from low and equatorial latitudes.

Internationally, the work of the United States Geological Survey (USGS), is coordinated with global geomagnetism institutes through the International Real-time Magnetic Observatory Network (INTERMAGNET; <http://www.intermagnet.org>), a voluntary consortium dedicated to promoting the operation of observatories according to modern standards [Kerridge, 2001]. Long-term archives of observatory data are maintained in the World Data Center (WDC) system. Indian Institute of Geomagnetism is part of INTERMAGNET with credit of two magnetic observatories of Alibag and Jaipur. The World Data Centre for Geomagnetism, Mumbai as part of the World Data System (WDS) is established by the International Council of Scientific Unions (ICSU). The data and services at the WDC for geomagnetism, Mumbai are available for scientific use without restrictions. The WDC Mumbai activities and data preserving, digitization process will be presented as a member of WDS.

### **REFERENCES**

Tsurutani, B. T., Gonzalez, W. D., Lakhina, G. S., & Alex, S. (2003). The extreme magnetic storm of 1–2 September 1859. *Journal of Geophysical Research: Space Physics*, 108(A7).

Kerridge, D. (2001). INTERMAGNET: Worldwide near-real-time geomagnetic observatory data, paper presented at. In *Space Weather Workshop: Looking Towards a European Space Weather*, Eur. Space Res. and Technol. Cent., Noordwijk, Netherlands.