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## Magnetic field turbulence studies aboard the China Seismo-Electromagnetic Satellite and related ground based phenomena

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With a new type of a scalar magnetometer, the Coupled Dark State Magnetometer (CDSM) aboard the China Seismo-Electromagnetic Satellite (CSES) mission, we observed magnetic field fluctuations in the period mid July 2018 until mid November 2018.

The measurement range of the CDSM is from 1000 nT up to 100000 nT and the accuracy 0.19 nT (1), the operational performance is discussed in (2). We are using 1 Hz data in the latitude range -65 degree to +65 degree, CSES has an altitude of approx. 507 km in Sun synchronous polar configuration with 97.4 degree inclination.

We analyzed the total magnetic field turbulence by converting the time series into thermodynamic parameters, e.g. entropy, finally these results have been compared with ground based seismic and volcanic events.

Ref:

(1) Pollinger, A., et al.: Coupled dark state magnetometer for the China Seismo-Electromagnetic Satellite, *Measurement Science and Technology*, 29, 9, 2018. <https://doi.org/10.1088/1361-6501/aacde4>

(2) Pollinger, A., et al.: In-orbit results of the Coupled Dark State Magnetometer aboard the China Seismo-Electromagnetic Satellite, *Geosci. Instrum. Method. Data Syst.*, 9, 275–291, 2020. <https://doi.org/10.5194/gi-9-275-2020>