



Seismo-magnetic events observed by the scalar Coupled Dark State Magnetometer (CDSM) aboard the China Seismo-Electromagnetic Satellite (CSES) mission

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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 several seismo-magnetic events 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). 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.

For the whole period the CDSM data are in good agreement with IGRF-12 and CHAOS-6 magnetic field models. Possible seismo-magnetic events are identified both in time- and frequency-domain, therefore an important issue is the differentiation between seismic- and nonseismic-events using satellite and ground-based facilities. The earthquake database is the USGS catalog. The CDSM seismo-magnetic events are identified correlating pre-, co-, and post-seismic 1 Hz datasets within a (variable) box around the earthquake location. This gives a kind of temporal and spatial region of seismo-magnetic influence.

We conclude, the CDSM measurements could be important to characterise activity related with earthquakes and volcanoes. Combined complementary investigations can strengthen our conclusions.

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>