

LONG-TERM SUPERSENSITIVE MAGNETIC OBSERVATION AT EILAT TEST SITE

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Three highly sensitive potassium total field sensors (GSMP-20S3, GEM systems) with intrinsic noise of $0.05 \text{ pT/Hz}^{-1/2}$ constitute a horizontal gradiometer. The magnetic gradiometer was installed in a horizontal 170-m man-made in-rock tunnel used during a long time as a geophysical observatory. The distance between sensors was varied in the range 3-50 m to test the system operation in real field conditions. Continuous magnetic component measurements are implemented with the help of DIDD vector magnetometer. Our results show that gradiometer time series contain external field variations, which are essentially homogenous in distances of the tunnel. That gradiometer variations could be explain by inhomogeneous magnetic field results from surrounding rocks leading to slight non-parallelism of magnetic field vector at the places where the sensors were located. High correlation between gradiometer and outer field variations provide to be an effective method of correcting gradiometer data. 'Cleaning' procedure based on mutual regression analysis of gradiometer and vector magnetometer time series. Long term regression coefficients changes may tell about the sensors stability and/or about local magnetic field changes. Regression analysis of gradiometer and vector magnetometer time series over the period 2002-2007 shows the absence from a long-term trend in the regression coefficients, whereas availability of yearly variations is evident. Conceivable reasons for yearly variations of regression coefficients will be discussed.

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Super gradiometer, magnetic monitoring

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