



A permanent array of magnetotelluric stations located at the South American subduction zone in Northern Chile.

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Monitoring the dynamic behavior of an active deep subduction system is focus of the Integrated Plate Boundary Observatory Chile (IPOC), a permanent array of combined geophysical and geodetic stations in Northern Chile which is operated since 2006 by the GFZ German Research Centre for Geosciences. Magnetotelluric (MT) data is gathered at seven out of a total of eleven observation sites. The MT set-up consists of three component long period fluxgate magnetometers and Ag/AgCl electrodes to measure the two horizontal components of the electric field. The signals of the electromagnetic fields are continuously sampled at a rate of 20 Hz and at four sites transferred via satellite link to the GFZ in Germany. The objective of the project is to monitor and analyze electromagnetic data to decipher possible changes in the subsurface resistivity distribution, e.g. as a consequence of large scale fluid relocation.

We present vertical magnetic transfer functions as time series over a time span of more than two years for the period range from 10^{-1} to 10^4 seconds. These vertical magnetic transfer functions are sensitive to lateral changes of electric conductivity in the subsurface. Miscellaneous components of these transfer functions show frequency dependent variations with a periodicity of roughly one year. These effects can be observed at all sites of the array. The causes are still unclear but we can rule out a direct meteoric influence on the sensors because of the homogeneous climatic conditions of the desert in Northern Chile.