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Improving geomagnetic observatory data in the South Atlantic Anomaly

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The Swarm mission clearly proofs the benefit of coordinated geomagnetic measurements from a well-tailored constellation in order to recover as good as possible the contributions of the various geomagnetic field sources. A similar truth applies to geomagnetic observatories. Their scientific value can be maximised by properly arranging the position of individual observatories with respect to the geometry of the external current systems in the ionosphere and magnetosphere, with respect to regions of particular interest for secular variation, and with respect to regions of anomalous electric conductivity in the ground.

Here, we report on our plans and recent efforts to upgrade geomagnetic observatories and to recover unpublished data from geomagnetic observatories at low latitudes in the South Atlantic Anomaly. In particular, we target the magnetic equator with the equatorial electrojet and low latitudes to characterise the Sq- and ring current. The observatory network that we present allows also to study the longitudinal structure of these external current systems. The South Atlantic Anomaly region is very interesting due to its secular variation. We will show newly recovered data and comparisons with existing data sets. On the technical side, we introduce low-power data loggers. In addition, we use mobile phone data transfer, which is rapidly evolving in the region and allows timely data access and quality control at remote sites that previously were not connected to the internet.