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Sparkling Geomagnetic Field: Involving Schools in Geomagnetic Research

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Solar activity will be reaching a maximum in 2013/2014 as the sun reaches the end of its cycle, bringing with it an opportunity to study in greater detail the effect of solar wind or "space weather" on our planet's magnetic field. Heightened solar activity leads to a larger amount of clouds of energetic particles bombarding the Earth. Although the Earth's magnetic field shields us from most of these particles, the field becomes distorted and compacted by the solar wind, which leads to magnetic storms that we detect from the surface. These storms cause aurorae at higher latitudes and can lead to widespread disruption of communication and navigation equipment all over the Earth when sufficiently strong.

This project, "Sparkling Geomagnetic Field," is a part of Austria's Sparkling Science programme, which aims to involve schools in active scientific research to encourage interest in science from a young age. Researchers from the Central Institute for Meteorology and Geodynamics (ZAMG) in Vienna have worked hand-in-hand with three schools across Austria to set up regional geomagnetic stations consisting of state-of-the-art scalar and vector magnetometers to monitor the effects of the solar wind on the geomagnetic field. The students have been an active part of the research team from the beginning, first searching for a suitable location to set up the stations as well as later overseeing the continued running of the equipment and analysing the data output. Through this project the students will gain experience in contemporary scientific methods: data processing and analysis, field work, as well as equipment setup and upkeep.

A total of three stations have been established with schools in Innsbruck, Tamsweg and Graz at roughly equal distances across Austria to run alongside the already active station in the Conrad Observatory near Vienna. Data acquisition runs through a data logger and software developed to deliver data in near realtime. This network allows for evaluation of both the spatial and temporal development of magnetic storms across the longitudes. Currently the stations are running in a test phase as the last system wrinkles are ironed out. The geomagnetic network will be running and delivering continuous data by spring 2014.