

Sparkling Geomagnetic Field: Involving Schools In Space Weather Observations



R. Bailey, R. Leonhardt, B. Leichter
Central Institute for Meteorology and Geodynamics, Vienna, Austria
Contact: rachel.bailey@zamg.ac.at

Setting up geomagnetic stations across Austria with the help of local schools as part of Austria's Sparkling Science programme.

Sparkling Science Programme

Austria's *Sparkling Science* Programme is an initiative funded by the Federal Ministry of Science and Research, started with the intention of breaking down barriers between education and academic institutions to encourage young scientists and involve them in current research.

Schools apply to take part in a joint research project with scientists. Various areas of science and research are covered, and the students are encouraged to be an active part of the scientific process.

The Project

Three schools are participating in the project to set up a total of four geomagnetic stations stretching the length of Austria: one station per school along with the Conrad Observatory near Vienna.

The locations of the stations are chosen by students and should be accessible to them for upkeep. The instruments are also all set up by students, thereby involving them directly in the research process.

Project Aims

1. Observe the solar maximum (occurring 2013/2014) and the effects of space weather on the geomagnetic field, both in field strength and direction across the regions of Austria.
2. Investigate the consequences of spatial and temporal variations in the magnetic field, i.e. magnetic storms, and their effect on communications systems.
3. Investigate temporal variations in detail to better understand the magnetic system Earth and its importance to humans.

Acknowledgements

The authors thank the following institutions:
- Bundesministerium für Wissenschaft und Forschung: Sparkling Science Programm
- ZAMG Department of Geophysics
- Gymnasium Sillgasse (Innsbruck), Tamsweg Gymnasium, Akademisches Gymnasium Graz

Current State - THE STATIONS:

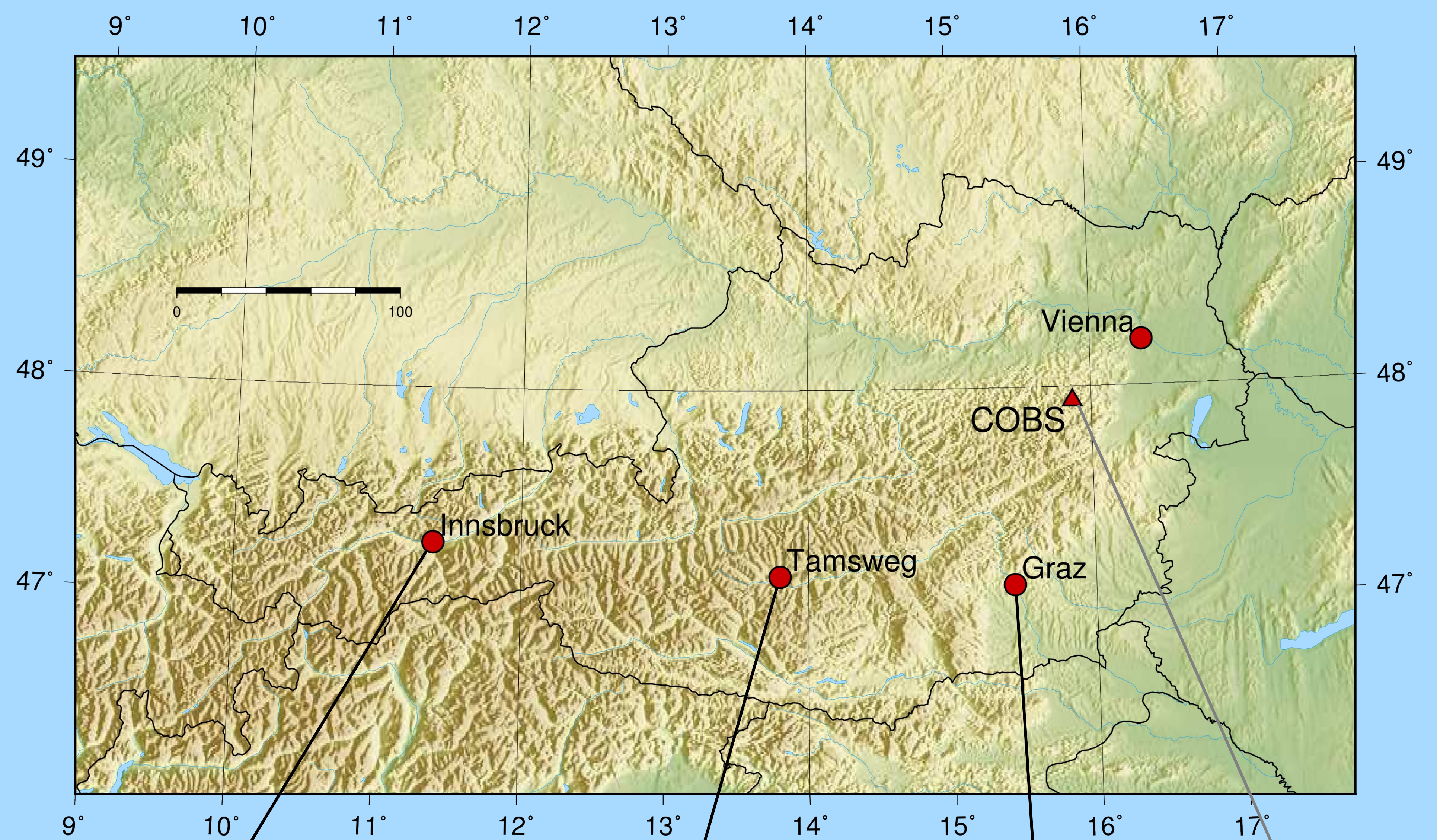
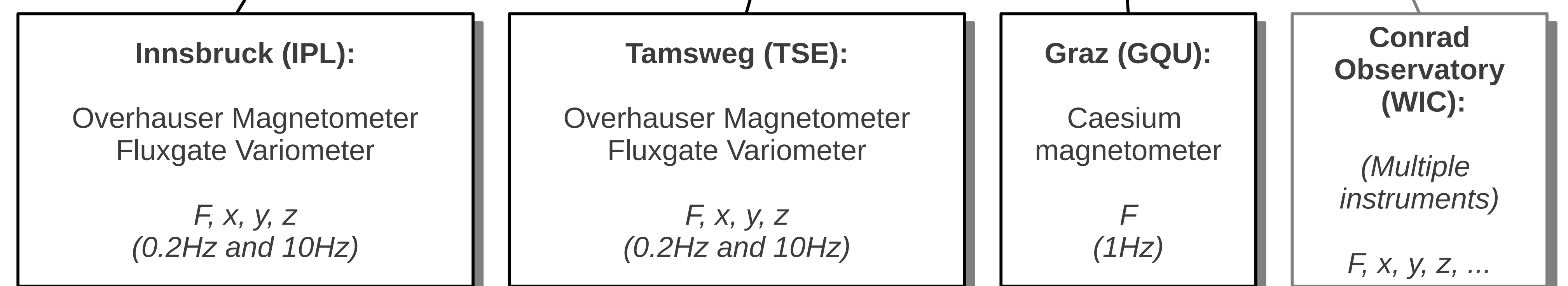


Fig. 1: A map of Austria showing the locations of the stations for the project Sparkling Geomagnetic Field.



All data is recorded locally on a PC as backup before being sent to a data collection server for analysis.

Our hope is to use the data gathered from the different stations to determine how the geomagnetic field changes as a function of position throughout the day and the nature of geomagnetic storms, as well as investigating the interaction between the ionosphere and space weather during this solar maximum.

$$F(\text{longitude, time}), x(P, t), y(P, t), z(P, t)$$

Moving Forward

Phase 1: Location (COMPLETE) – Students have searched for and chosen suitable magnetically quiet locations for the running of the magnetometers.

Phase 2: Setup (IN PROGRESS) – Once a suitable location has been found and tested, the students will setup the instruments, which are ready to start measuring data and send it to a central storage server.

Phase 3: Data Analysis (Winter 2013-2014) – Data from all stations will ideally be available in real-time over a website to any student or researcher who wishes to view it. The students will be encouraged to monitor the effects of space weather, an exciting aspect of the solar maximum. They will have free access to all the data as well as evaluation software to analyse the data.

