Interfering with the Global Positioning System

June 9 2008

You can't always trust your GPS gadget. As scientists have long known, perplexing electrical activity in the upper atmospheric zone called the ionosphere can tamper with signals from GPS satellites.

Now, new research and monitoring systems are clarifying what happens to disruptive clouds of electrons and other electrically charged particles, known as ions, in the ionosphere. The work may lead to regional predictions of reduced GPS reliability and accuracy.

One team of researchers has recently observed Earth's aurora, which is a prominent manifestation of ionospheric electrical activity, in the act of disrupting GPS equipment. Other scientists have successfully tested a way to forecast GPS disturbances for marine users, with likely extension to users on land.

Some research groups are turning the tables and employing GPS receivers as tools with which to conduct basic research on the electrical-current structures of the ionosphere.

The scientific reports on these and other recent developments are available in a special section of *Space Weather: The International Journal of Research and Applications*, a publication of the American Geophysical Union, or AGU.

An article that introduces the section was posted online Friday, June 6. It summarizes past research and operational developments regarding

ionospheric effects on GPS, and discusses potential future improvements in the field.

The new introductory article is available at www.agu.org/journals/sw/swa/free (Click on "Space Weather and the Global Positioning System"). The special section itself, which currently contains seven scientific reports, is available online at www.agu.org/journals/sw/?conte … alsections&ssid=GPS1

Source: American Geophysical Union