



Januari 22, 2009
Press release

Belgian GPS station on the South Pole

Another step against global warming

The Belgian Princess Elisabeth base installed at Utsteinen, Antarctica, will be officially inaugurated in February 2009. This base will host scientists and various instruments. One of its objectives is to improve our understanding of climate-related mechanisms, a first step in the fight against climate change.

The Royal Observatory of Belgium (ROB) is involved in the first season of scientific missions 2008-2009. In February 2009, Dr. Nicolas Bergeot from the ROB will install two permanent high precision GPS (Global Positioning System) stations, called "ELIS" (ELISabeth, Belgium station) and « ULUX » (Utsteinen LUXemburg, Luxemburg station). The continuous measurement of the position of these stations will allow the ROB to estimate the horizontal and vertical deformation of the Earth surface over time with a precision of one millimetre per year.

The huge mass of glaciers deforms the Earth's crust. This is the case of the Antarctic continent, which is deforming slowly due to large amounts of ice melting at the end of the last ice age, 10 000 years ago. On the other hand, there is a faster deformation caused by variations of current glaciers, caused by global warming. To separate these two components of the deformation, it is necessary to combine measurements of surface deformation from GPS data with measurements of gravity variations using an absolute gravimeter. This is the aim of the GIANT project (Geodesy for Ice in Antarctica), lead by the ROB and the University of Luxembourg. From the next austral summer, the ROB will proceed to an annual gravity measurement campaign, in collaboration with the University of Luxembourg.



Another use of GPS data will be to better understand the physics of the atmosphere in this region of the globe, thanks to the atmospheric parameters measured by GPS (quantity of water vapor in the atmosphere and electron density of the ionosphere). Finally, the global distribution of GPS stations remains poor on the Antarctic continent, because of extreme conditions, random and expensive communications and difficult access. The installation of "ELIS" and "ULUX" will densify, at the South Pole, the global network of permanent GPS stations used to determine the global coordinate system.

To install the GPS stations, the Department CISS (Department Communication, Information System & Sensors) from the Royal Military Academy has developed, in collaboration with the Observatory, a system tailored to the extreme conditions of Antarctica. The system allows also the smoothly download the ELIS GPS data to Belgium where they will be analyzed by scientists of the ROB. The GPS receiver of the station "ELIS" is also Belgian as it has been provided by the firm Septentrio (Leuven).



Dr. Nicolas Bergeot got his PhD in Internal Geophysics (2007, Institut de Physique du Globe at Paris). He collected and processed GPS data for ground deformation interpretation (tectonic and seismic cycle) in a subduction zone context (Vanuatu, South-West Pacific). Subduction is a process in which one tectonic plate moves under another tectonic plate.

Since the end of 2007, he is one of the scientists in the GNSS (Global Navigation Satellite System) group at the ROB. He monitors the ionosphere using the European Permanent Network of GPS stations.

The Solar-Terrestrial Center of Excellence is a Belgian institute that bundles the know-how from Sun to Earth of three federal scientific institutes. The ROB is one of them and is situated in Brussels.

Contact :

Royal Observatory of Belgium - Solar-Terrestrial Center of Excellence
Av. Circulaire, 3, Ringlaan
B-1180 Ukkel (Brussels)

Dr. Nicolas Bergeot, scientist (Fr) +32 (0) 2 373 06 19, Nicolas.Bergeot@oma.be
Dr. Carine Bruyninx, scientist (Ned) +32 (0) 2 373 0292, Carine.Bruyninx@oma.be