# The SIDC-GPS Space Weather service

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# Objectives

- The Goal of the SIDC GPS Space Weather service is to assess in real time and to forecast SW effects on GPS real time differential applications

- The information is published through a web interface or using emails warning users when strongly disturbed SW conditions are observed or forecast

- The GPS applications considered are mainly the so-called DGPS (differential navigation, accuracy at meter level) and Real Time Kinematic or RTK (real time surveying technique, accuracy at a few cm level)

# User Requirements (UR)

- **UR-1** : Real-time assessment of Space Weather (ionosphere) effects on the accuracy of DGPS positioning as a function of the distance between the user and the DGPS reference station.

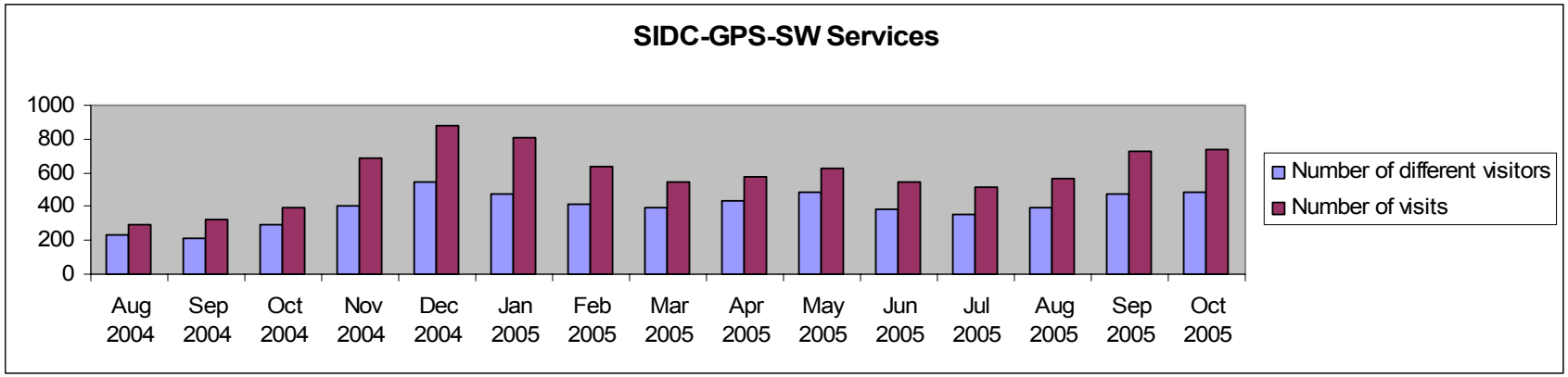
- **UR-2 :** Real-time assessment of Space Weather effects on the accuracy (reliability) of RTK positioning.

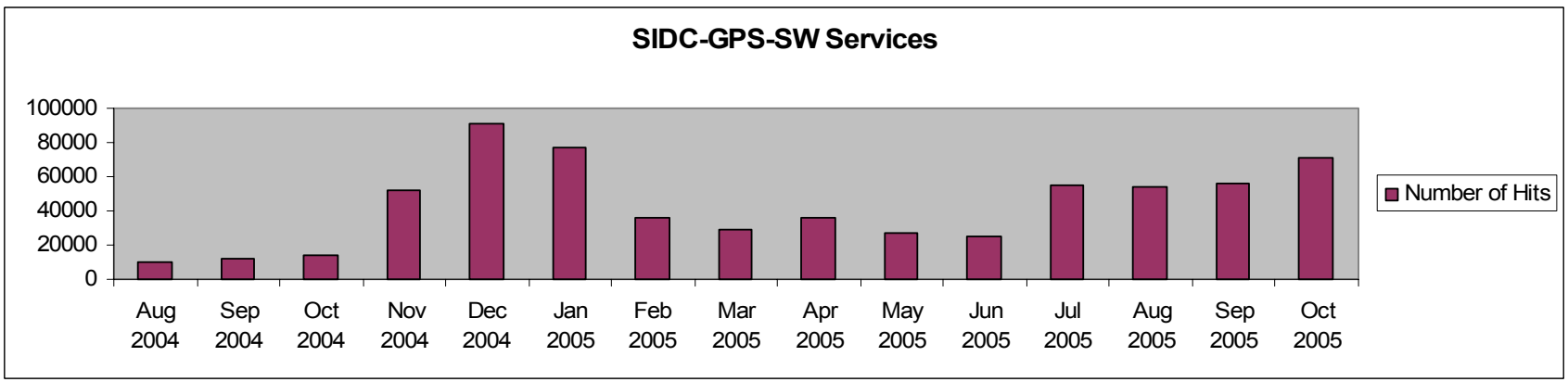
- **UR-3** : Forecasts 24 hours in advance of the occurrence of severely degraded RTK positioning conditions due to Space Weather over Belgium.

# User satisfaction

- Not possible to demonstrate any economic impact
- Most of the user requirements have been satisfied except:
  - Our products are available in near real time i.e. on an hourly basis (delay of up to 1 hour before availability of products)
  - The DGPS product is only available in a circle of about 1500 km around Brussels
  - The RTK product only gives a qualitative assessment (using colors) and not a quantitative assessment (directly in terms of positioning errors) of SW effects
  - The warnings (forecasts) against highly degraded RTK positioning conditions are issued only a few hours in advance

# Web statistics



# Sustainability

- At the present time, the services are maintained using ROB funding.
- It is the intention of the ROB to continue to provide the existing services and even to further develop them as long as funding is available.
- Funding should be available at least up to the end of 2006.
- Minimal funding for the maintenance and the « light » development of the services : 50 000 EUR/year
- Ideal funding to conduct the research which is necessary for the improvement of the services : 100 000 EUR/year

# Possible improvements

- The products could be available closer to « true » real time by improving the data flow between GPS stations and the processing center.

- The effect of SW on RTK could be assessed directly in terms of positioning errors and not using colours

- The RTK product could make use of more GPS stations :
  - To cover a larger geographical area
  - To have a better spatial resolution

- The forecasts of highly degraded positioning conditions could be issued earlier and be more quantitative.