SCAR ACTION GROUP: GPS FOR WEATHER AND SPACE WEATHER FORECAST

DATA AND TOOLS AVAILABILITY FORM

Station or acquisition acronym:

DMC0

Instrumentation and data kind description:

> GISTM Ionospheric Scintillation data. The GISTM (GPS Ionospheric Scintillation and TEC Monitor) consists of a NovAtel OEM4 dual-frequency GPS receiver with special firmware able to compute the amplitude and the phase scintillation indices from GPS L1 frequency signals. GISTMs are also able to calculate the ionospheric not calibrated TEC and its rate of change (ROT). from the GPS L1 and L2 carrier phase signals over time intervals of 15 seconds (Van Dierendonck et al., Ionospheric scintillation monitoring using commercial single frequency C/A code receivers, in: ION GPS-93 Proceedings of the 6th International Technical Meeting of the Satellite Division of the Institute of Navigation, Salt Lake City, USA, 22-24 September pp. 1333-1342, 1993.)

Localization:

Concordia Base – Dome C - Antarctica	75.0°S, 123.0°E

Periods of acquisition:

10/1/08	today

, 2nd period

From	To

, 3rd period

From	To

, …

Data file request info (please refer to the following "Data files" section):

Data file (kind 1)	Contact name and email: Vincenzo Romano - vincenzo.romano@ingv.it
Data file (kind 2)	Contact name and email
Data file (kind 3)	Contact name and email

…

List of Web addresses where data or info can be found: http://eswua.ingv.it

Data tools request info (please refer to the following "Data analysis tools" section):

Data analysis tool (kind 1)	Contact name and email Luca Spogli luca.spogli@ingv.it

Date

Date, 29/07/2010

Compiler

Compiler name and email: Luca Spogli – luca.spogli@ingv.it

Data files:

1) File description (1st file):

File name	File sampling	Typical file size
DMC0S_YYMMDDHHMM.S60	15 m	36.5 KB

ASCII or Binary?	Easy convertible in ASCII?	Data coverage estimation (%)
Binary	Yes	99%

Data format header:

Week, GPS TOW, PRN, RxStatus, Az, Elv, L1 CNo, S4, S4 Cor, 1SecSigma, 3SecSigma, 10SecSigma, 30SecSigma, 60SecSigma, Code-Carrier, C-CStdev, TEC45, TECRate45, TEC30, TECRate30, TEC15, TECRate15, TEC0, TECRate0, L1 LockTime, ChanStatus, L2 LockTime, L2 CNo

Principal parameters:

1
Description of the first parameter useful for the AG activity. The parameter is directly available by the data file or it can be calculated with an easy procedure.
Scintillation indices (S4 and σ_Φ) over different time intervals (1-3-10-60 seconds)

2
Description of the second parameter useful for the AG activity. The parameter is directly available by the data file or it can be calculated with an easy procedure.
Total Electron Content (TEC) and Rate of TEC change over different time intervals (15-30-45-60 seconds)

3
Description of third parameter useful for the AG activity. The parameter is directly available by the data file or it can be calculated with an easy procedure.
GISTM Receiver signal quality (L1 CNo, L1 LockTime, L2 CNo, L2 LockTime, Code-Carrier)

Data analysis tools:

1) Tool name:

Scintillation climatology tool

Tool description:

Tool to generate maps of percentage of occurrence of the scintillation indices above a given threshold

Tool support description:

Tool run under the software analysis tool ROOT (available at http://root.cern.ch)

Inputs :

1. Pre-processed ROOT files, generated starting from Binary files described in File Description (1st File - see above section) 2. Tool datacard to specify some features of the maps of percentage of occurrence of the scintillation indices (Number of the receivers to generate the maps, Time interval, Kind of coordinates, etc.) 3. Ascii files of geomagnetic indices (Kp and Dst) to characterize quiet/disturbed conditions

Output description :

Two Gif files with the two maps of percentage of occurrence of the scintillation indices above the given threshold accordingly to the datacard

Attachments (any useful file attached to this document as articles, figures, data files examples...)

1	Scintillation maps example	Example of the output of the Data analysis tool #1: two gif files showing the maps of percentage of occurrence of the scintillation indices above a selected threshold

Datacard	Example of datacard as input to the Data analysis tool #1
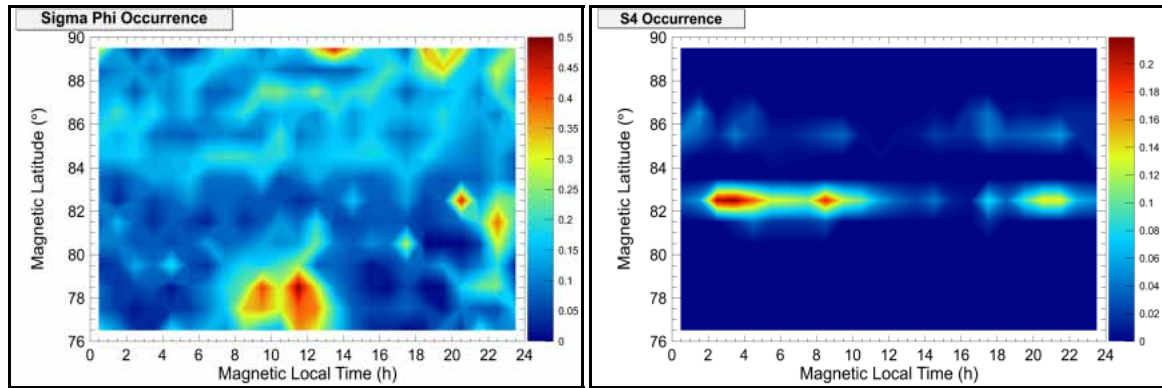
```
#datacard for scintillation maps
#Start date (YYMMDD)
080101
#End date (YYMMDD)
081231
#Number of receivers
1
#RECEIVER ID(s):
DMC0S
#SigmaPhi threshold to calculate occurrency (radians)
0.25
#S4 threshold to calculate occurrency
0.25
#Slant or Vertical quantities
Vertical
#Elevation angle threshold (degrees)
20
#Accuracy cut (0->100)
2.5
#Selection of data upon geomagnetic activity (All/Quiet/Dist)
All
#Geomagnetic beahvior selection criterion (Kp/Dst)
Kp
#Maps dimension (2D/3D)
2D
#Geographic or Geomagnetic coordinates?
Geographic
#Hemisphere (North/South)
South
#Y-axis Range (Geographic or Geomagnetic Latitude) (Min Max Step)
-90  -60 1
#X-axis Range (Geographic Longitude or Magnetic Local Time) (Min Max Step)
0 360 1
#Working directory (typically one level before)
/ScintillationAnalysis/
```