"Quickmaps and historyof the effects of ionospheric scintillations on GPS/GLONASS signals" Project status

SDA for ESA Space Weather Applications Pilot Project

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Introduction

Project status

- **User needs & technical specifications**
- **Service development starting**
- **User Interface**
  web site
  data bank
- **Calibration**

Industry : user needs

User needs list (Ref. number)		Activity: Oil exploration	Airplane nav	GPS/ATV mission analysis	GPS equipt	Telecoms
SCINT	Scintillations	(ref/pred)	(ref/pred)			
1	Where and When	1	1	2		1
2	Intensity	1	1			1
3	Worst case		1			
4	Prediction	1	1			2
TEC	Other ionospheric parameters					
1	VTEC (vertical)	2				
2	VTEC time variation & TID detection/statistics	2				
3	Horizontal TEC gradient					
SYST	Effects on the systems		(ref/pred)			
1	GDOP degradation	2				
2	Location/Navigation/Timing induced GPS errors	2	2		2	
3	GPS/GLONASS availability		1	1	1	
4	Signal power attenuation			1	2	
5	class of receiver robustness	3			2	
SYST	Other topics	sat. gaps	Notam			
6	GPS alarm bulletin	2	1			
SW	Additional needs					
1	CME, storms	3				

Priorities from 1 (highest) to 3 (lowest) knowing the context of the original proposal

Science : user needs

User needs list (Ref. number)		Comments	Priorities
SCINT	Scintillations		
5	Data base / history	The parameters are listed	1
6	Archive system and easy access	For long term analysis	1
2	Index definition and calibration	Need for external data ($ISM_{\omega,\ldots}$)	1
4	Prediction	Model testing in the future	3
TEC	Other ionospheric parameters		
1	VTEC (vertical)	Minimum accuracy expected	2
2-3	VTEC time variation & TID detection/statistics	Monitoring for scientific investigation	2

Priorities from 1 (highest) to 3 (lowest) knowing the context of the original proposal

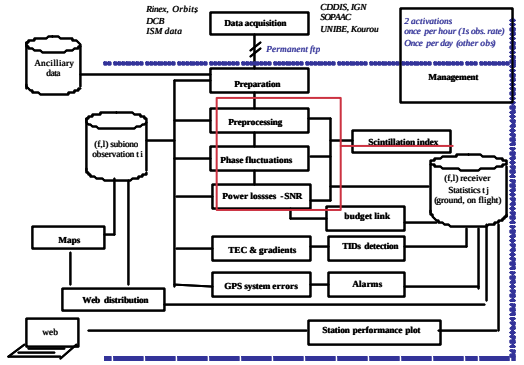
ROB

Technical specifications: scintillations products

User needs list (Ref. number)		Service development plan			
		Product	Basic Service	Added value	Future
SCINT	Scintillations				
1	Where and When	global maps of scintillation location	X		
2	Intensity	global maps of scintillation index	b.e.		
3	Worst case	Study report, alert message (tbd)		X	
4	Prediction	models testing and comparison			X

Maps : discrete, projection at sub-ionospheric point, with night/day transition, 1h refreshment (objective)
24 hours animation

Service development: starting



Service development: preliminary criteria analysis

Ionospheric scintillations identification mixed criteria:

1: cycle slip levels on both frequencies
2: power attenuation
3: phase fluctuations
4: losses of observation (especially L1-L2)

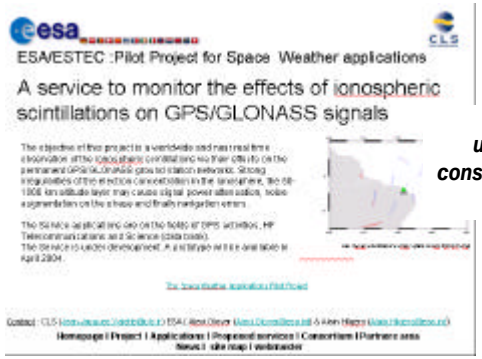
Test on criteria 4 (L2 losses) 1 day at Fortalezza

User Interface

Web site: under construction

Data bank: NetCDF format files for scintillations & TEC
> array-oriented scientific data
> machine-independent format
> dimensions, variables, attributes (global, local)
(http://www.unidata.ucar.edu/packages/netcdf/)

Web site: homepage



under construction

Calibration

ISM (Ionospheric Scintillation Monitors)

Data sets from IESSG at Nottingham Univ. of 5 ISMs in Europe

One dedicated ISM is planned at Kourou