Format of the GPS scintillation data

Yaqi Jin 2018-10-23

The GPS scintillation data at Ny-Ålesund and Skibotn are from the GPS IONOSPHERIC SCINTILLATION & TEC MONITOR (GISTM) GSV4004B. The data is read from the binary *.ism files and written to *.dat file in ASCII format.

The output data format is:

Columns 1-4: YEAR, MONTH, DAY, second since midnight

Columns 5-6: TOTAL TRACKED SATELLITE, PRN CODE

Columns 7-9: AZIMUTH, ELEVATION, CN0

Columns 10-11: TOTAL S4, CORRECTION TO TOTAL S4

Columns 12-16: 1-SEC SIGMA_PHI, 3-SEC SIGMA, 10-SEC SIGMA, 30-SEC SIGMA, 60-SEC SIGMA

Columns 17-18: CODE CARRIER DIVERGENCE, STD OF CODE CARRIER DIVERGENCE

Columns 19-26: TEC AT TOW-45, DELTA TEC FROM TOW-60 TO TOW-45,…,TEC AT TOW, DELTA TEC FROM TWO-15 TO TOW

Columns 25: TEC at TOW

Columns 27: L1 LOCK TIME

Columns 28: CHANNEL STATUS

 Columns 29-30: L2 LOCK TIME, L2 CN0

For more details, please read page 6 of the User's manual of GISTM.

Please keep in mind that here the leap second between the GPS time and UTC is not considered. The scintillation data is in 60-second resolution and the leap second is considered to be small in this case.

Suggestions:

Please use the phase scintillation data (σ_ϕ) when the lock time is longer than 240 seconds, and use the amplitude scintillation data (S_4) when the lock time is longer than 60 seconds. For Ny-Ålesund, it is OK to use GPS data for elevation angle larger than 15˚, however, it is suggested to use the data above 20˚. For Skibotn, we suggest to use data above 30˚.