SCHOOL on GPS at BREST/France
[13 - 17 February 2017]

Organized by GIRGEA
« Groupe International de Recherche en Géophysique EUROPE AFRIQUE »

Teacher :
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- Theoretical Lectures and practical works
- The GPS system
- The RINEX format
- The data bases
- The almanac files and ephemeris
- Calculating the position of the GPS satellites
- Processing of GPS measurements using Matlab -
- VTEC results from VTEC_RF software
- TEC Values on the Web (GIM maps)
- Calculating the ROTI index, proxy for scintillation
- Ionosonde (Databases)
- Magnetic indices for storms

Number of participants : maximum 8
Scientific secretary of GIRGEA : christine.amory@lpp.polytechnique.fr

The national school of Telecom Brest will assume the local financial support of all participants – The training is in French

- ### **DAY 1 : February 13**

1.1 The GPS system, introduction (principle, frequency, modulation, coding, ...)

1.2 Databases measures, ftp transfers, decompression Hatanaka, the rinex file, exercises.

Other measures: almanac, ephemeris, precise orbits, the satellites biais

DAY 2 : February 14

2.1. The rinex file, structure, reading Matlab, view P1, L1, S1 over time for a given number GPS.

2.2. The almanac or ephemeris file, structure and read with Matlab, calculating the position of the satellites, visualization.

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3.1. TEC models: IRI and NeQuick, availability, performances (online for IRI, with Matlab for NeQuick)

3.2. TEC values available on the Web: List of some sites, the IONEX format, playback and visualization with Matlab, another possibility (Leica gnss qc)

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4.1. Calculation of slant STEC by the recombination of the frequencies, calculations with Matlab (with code and phase) and visualization. Procedures to implement, effects of multiple paths.

4.2. Calculation of the receiver bias and determination of the 'absolute' STEC, transition to vertical VTEC by the law of Secant, IPP position, developments in Matlab

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5.1. Ionosonde (what is available on the web)
Scintillation, calculate ROTI index from GPS measurements

5.2. Accurate positioning from Rinex files: available sites and online calculations, interpreting results.

The examples used for the exercices are mostly illustrated from measurements of existing African stations: Dakar, Koudougou, Port Gentil (NKLG) etc ..., and data from GPS stations of the participants.

The development with Matlab will be enough 'simplified' for those who do not know the language