

Some recommendations about the use of the DORIS data in the RINEX format.

Source:

Email "DORIS RINEX data processing" from IDS Analysis Coordination to Analysis Working Group, March 25, 2015

Compared to the doris2.2 format, in the RINEX format the following corrections (given by measurements) are no longer mentioned:

- the center of mass correction including both effects: satellites and beacons
- the tropospheric refraction correction
- the ionospheric refraction correction
- the measurement doesn't take into account the best estimate of the actual satellite frequency (long term on-board frequency drift not taken into account)

So, to use the RINEX file data it is necessary:

- to implement the ground antenna geometries in order to be able to position the 400 MHz, 2 GHz and iono-free phase centers with respect to the reference point of the antenna (the middle of the antenna base in the case of the ALCATEL antenna, the 400 MHz phase center in the case of the STAREC antenna)
- to implement the attitude law for each satellite in your software in order to be able to compute the phase-center-to-center-of-mass vector for each measurement
- to use a tropospheric model
- to apply the ionospheric correction by the use of the iono-free combination (BEWARE: the phase center to use is not the 2 GHz phase center any more, but the iono-free phase center)
- to estimate a long term on-board frequency drift

References:

- DORIS_models&solutions_v1.0.pdf, draft version (Flavien Mercier, CNES) (gives the equations to process the DORIS data from RINEX data file).
- DORIS_RINEX_implementation_in_GINS.v2.pdf (Jean-Michel Lemoine, CNES) (presents how RINEX data file are processed in the GINS software). [NB: version v1 of the document included a false formulation of the ionospheric correction; corrected in version v2 sent to AWG on April 1st, 2015]