

RINEX Data Visualization

For Observation and Navigation data

Software: RTKLIB 2.4.2 b11. RTKPLOT

Goal for this tutorial

- Visualize RAW RINEX data
 - Easy to examine your raw data with RTKPLOT



RTKLIB 2.4.2

<http://www.rtklib.com/>

RTKLIB 2.4.2 manual

http://www.rtklib.com/prog/manual_2.4.2.pdf

RINEX 3.02 (The Receiver Independent Exchange Format Version 3.02)

<ftp://igs.org/pub/data/format/rinex302.pdf>

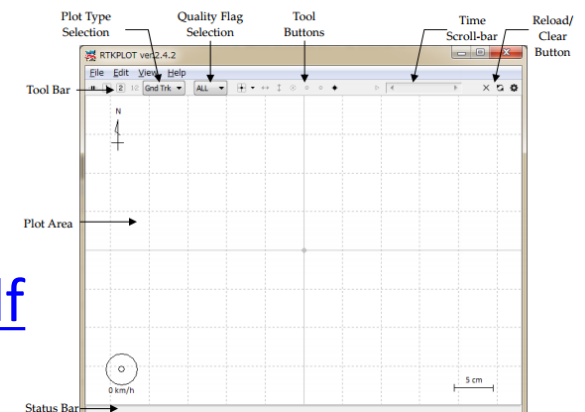
RTKLIB 2.4.2 manual

RTKLIB ver. 2.4.2 Manual

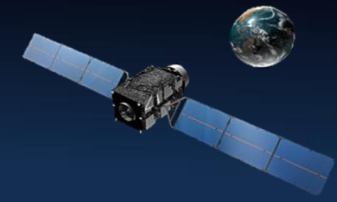
3.7 View and Plot Solutions with RTKPLOT

RTKLIB contains the AP RTKPLOT to view and plot the positioning solutions by RTKPOST and RTKNAVI with graphical user interface. RTKPLOT also accepts general NMEA 0183 files or streams to generate the solution plot.

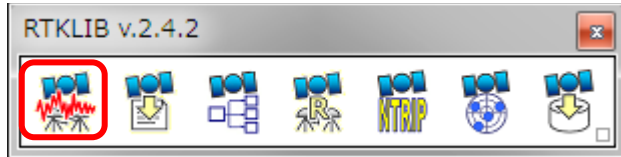
- (1) Execute the binary AP file `<install dir>\rtklib_<ver>\bin\rtkplot.exe`. You can see the main window of RTKPLOT. By pushing `[Plot...]` button or some buttons of RTKPOST and RTKCONV, RTKPLOT is also executed.



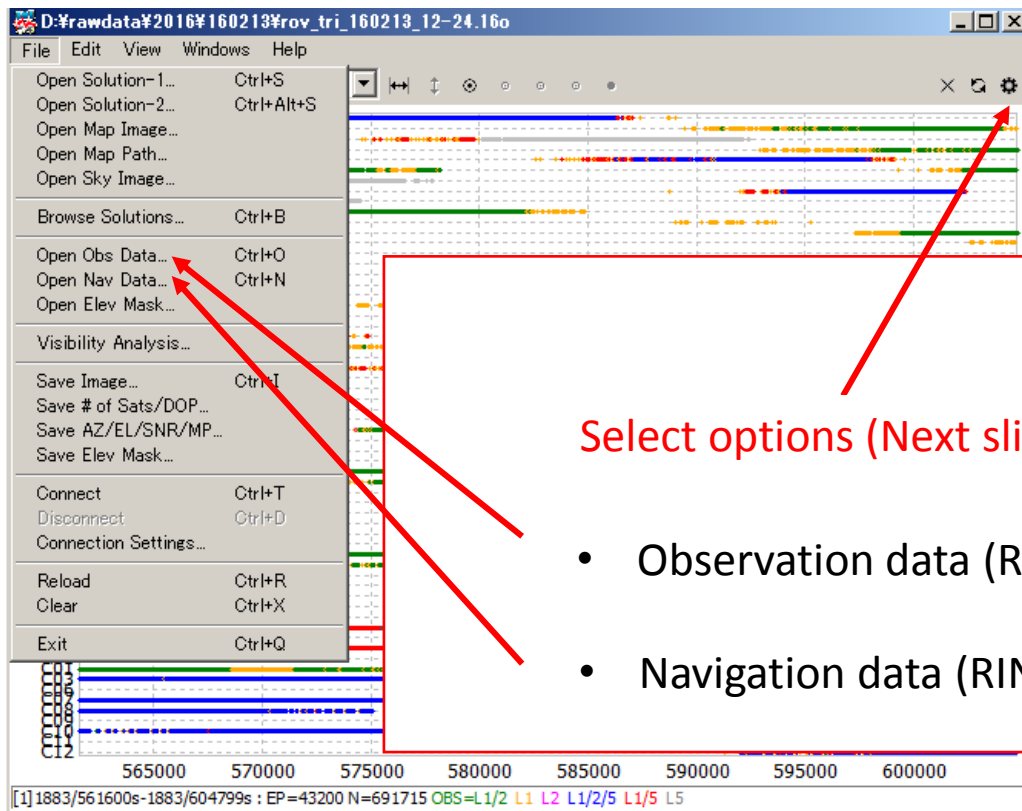
Convert BINEX to RINEX



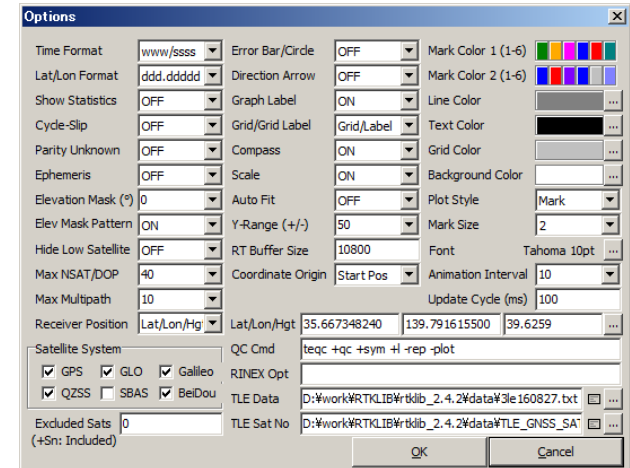
- Open RTKPLLOT



- Input data



Initial (default) option settings



Select options (Next slide)

- Observation data (RINEX)
- Navigation data (RINEX)

Settings options in RTKLIB 2.4.2 manual (p. 63~)



Options

Time Format	h:m:s GPST	Error Bar/Circle	OFF	Mark Color 1 (1-6)	[Color palette]
Lat/Lon Format	ddd.ddddd	Direction Arrow	OFF	Mark Color 2 (1-6)	[Color palette]
Show Statistics	OFF	Graph Label	ON	Line Color	[Color palette]
Cycle-Slip	OFF	Grid/Grid Label	Grid/Label	Text Color	[Color palette]
Parity Unknown	OFF	Compass	ON	Grid Color	[Color palette]
Ephemeris	OFF	Scale	ON	Background Color	[Color palette]
Elevation Mask (°)	0	Auto Fit	OFF	Plot Style	Mark
Elev Mask Pattern	OFF	Y-Range (+/-)	50	Mark Size	2
Hide Low Satellite	OFF	RT Buffer Size	10800	Font	Tahoma 10pt
Max NSAT/DOP	40	Coordinate Origin	Lat/Lon/Hgt	Animation Interval	10
Max Multipath	10			Update Cycle (ms)	100
Receiver Position	Lat/Lon/Hgt	Lat/Lon/Hgt	35.666502710 139.792380500 59.4189		
Satellite System	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> GLO <input checked="" type="checkbox"/> Galileo <input checked="" type="checkbox"/> QZSS <input type="checkbox"/> SBAS <input checked="" type="checkbox"/> BeiDou	QC Cmd	teqc +qc +sym +l -rep -plot		
Excluded Sats (+Sn: Included)	0	RINEX Opt			
		TLE Data	D:%work%RTKLIB%rtklib		
		TLE Sat No	D:%work%RTKLIB%rtklib		

OK

Time format

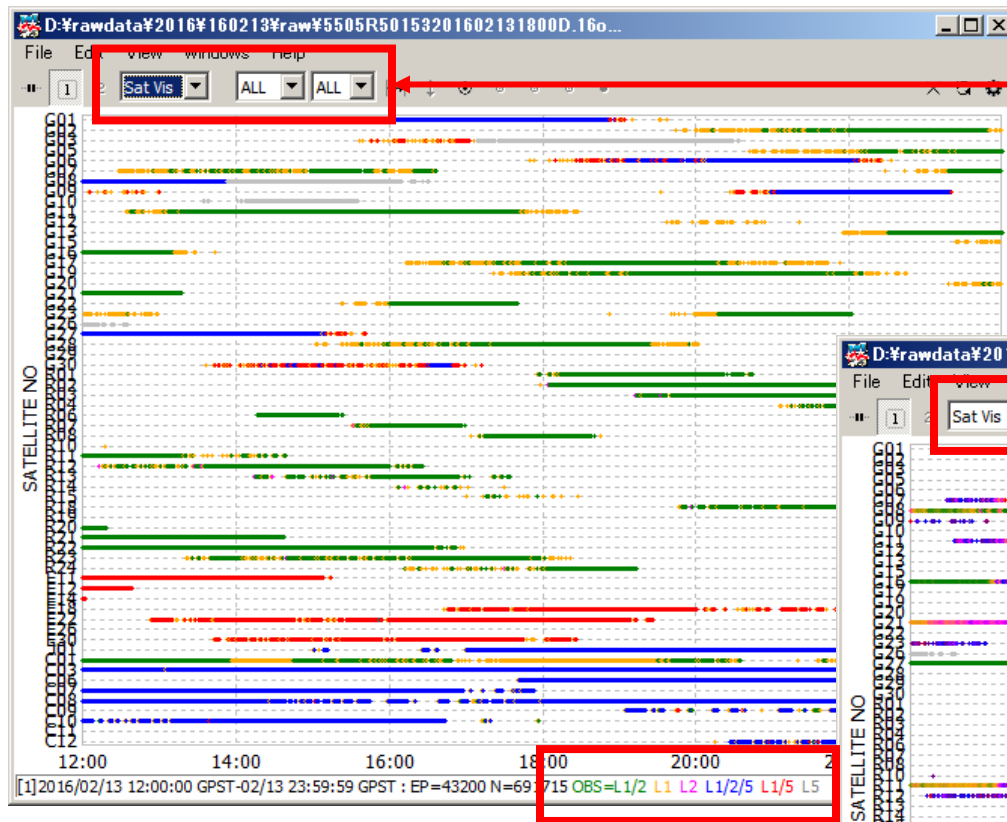
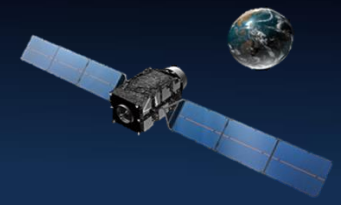
Elevation mask

Receiver position

Receiver Position Set the receiver position for the satellite visibility plot or skyplot. "Single Solution" uses single-point results as receiver positions by using observation and navigation data. For moving receivers, you shall set it. "Lat/Lon/Hgt" uses latitude, longitude and height for static receivers specified as the following Lat/Lon/Hgt fields. "RINEX Header" uses "APPROX POSITION XYZ" in RINEX observation data header as the receiver position.

Select satellite systems in RINEX data files

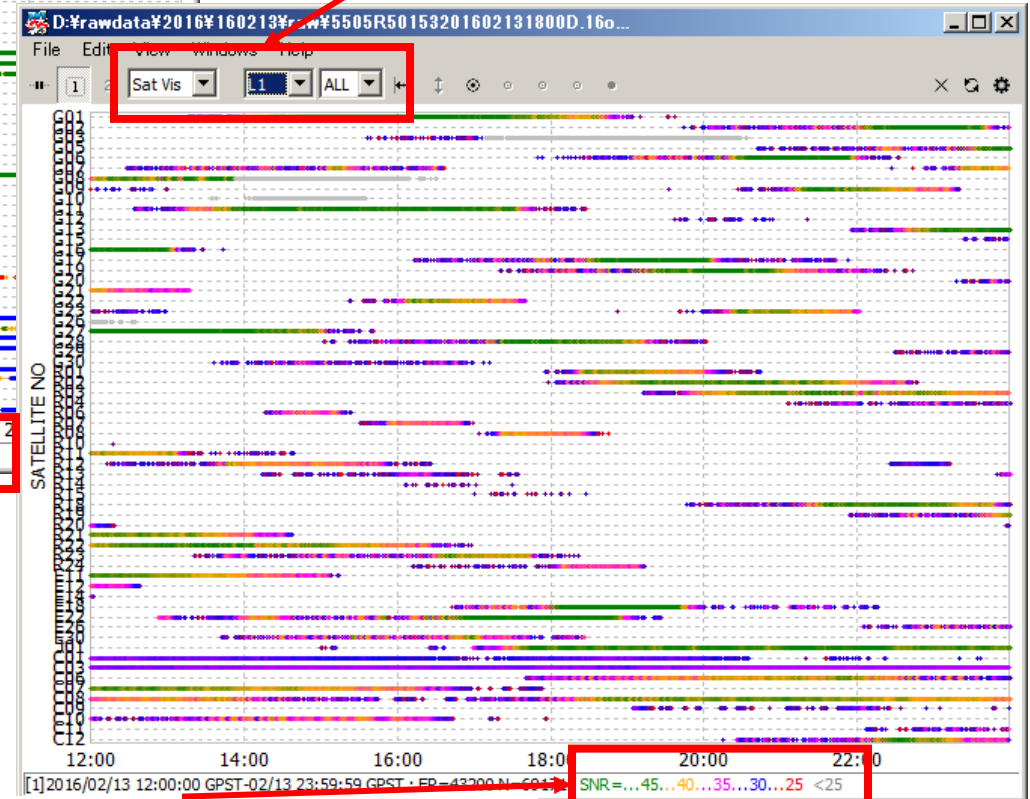
Time Series of Satellite Visibility



Select All satellites

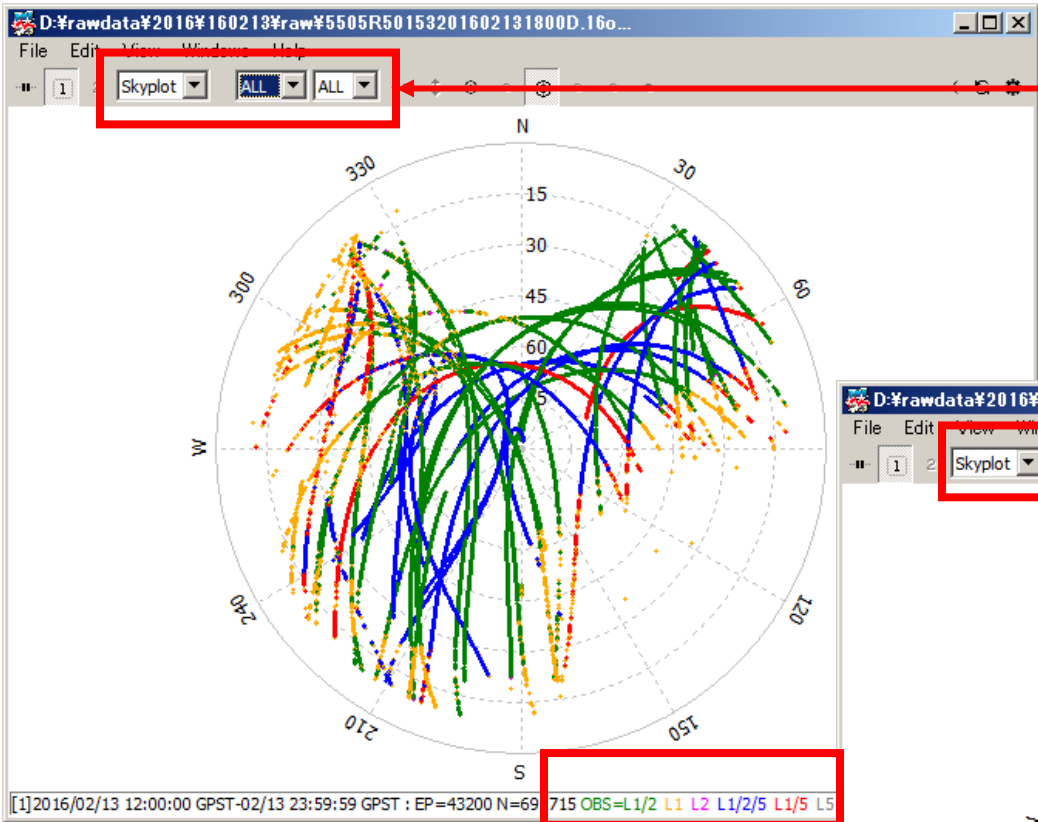
L1 signals for all satellites

Color indicating received frequencies



SNR Heat map

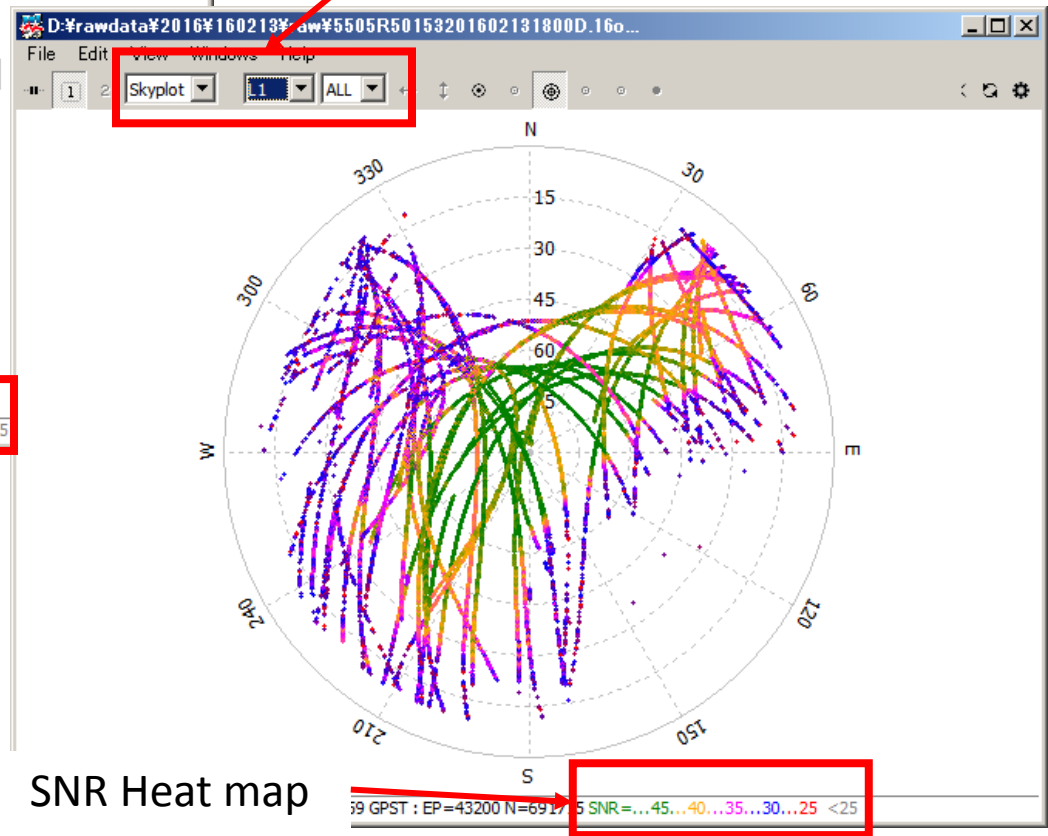
Sky Plot



Select All satellites

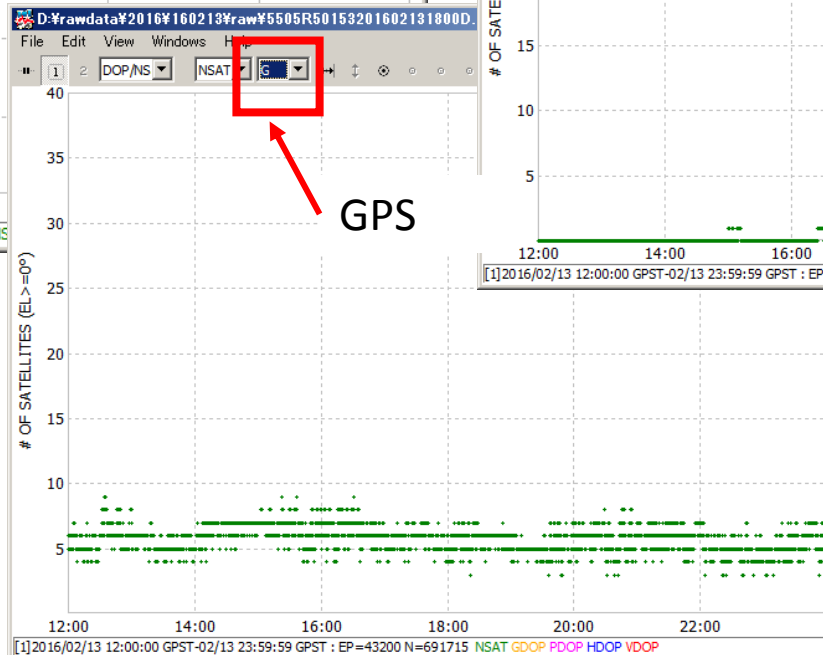
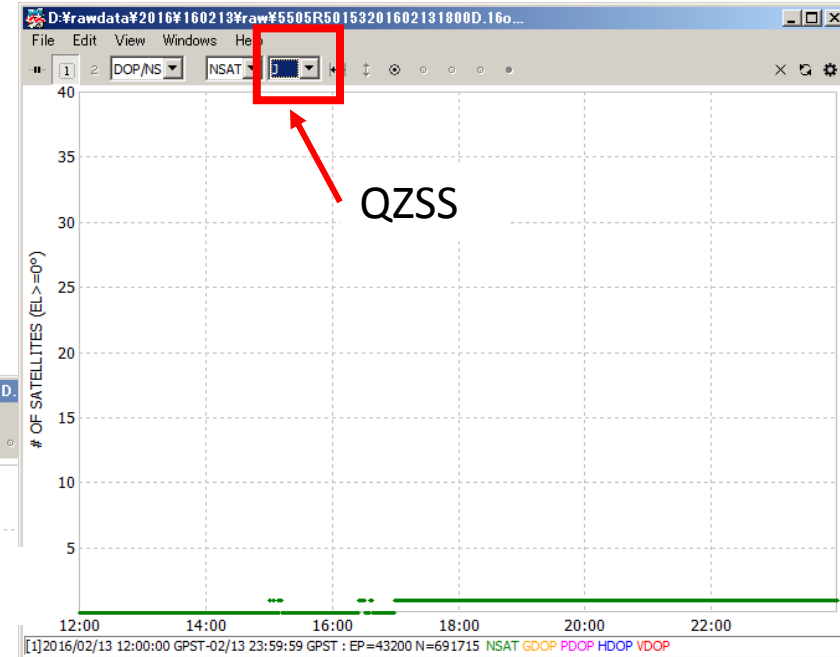
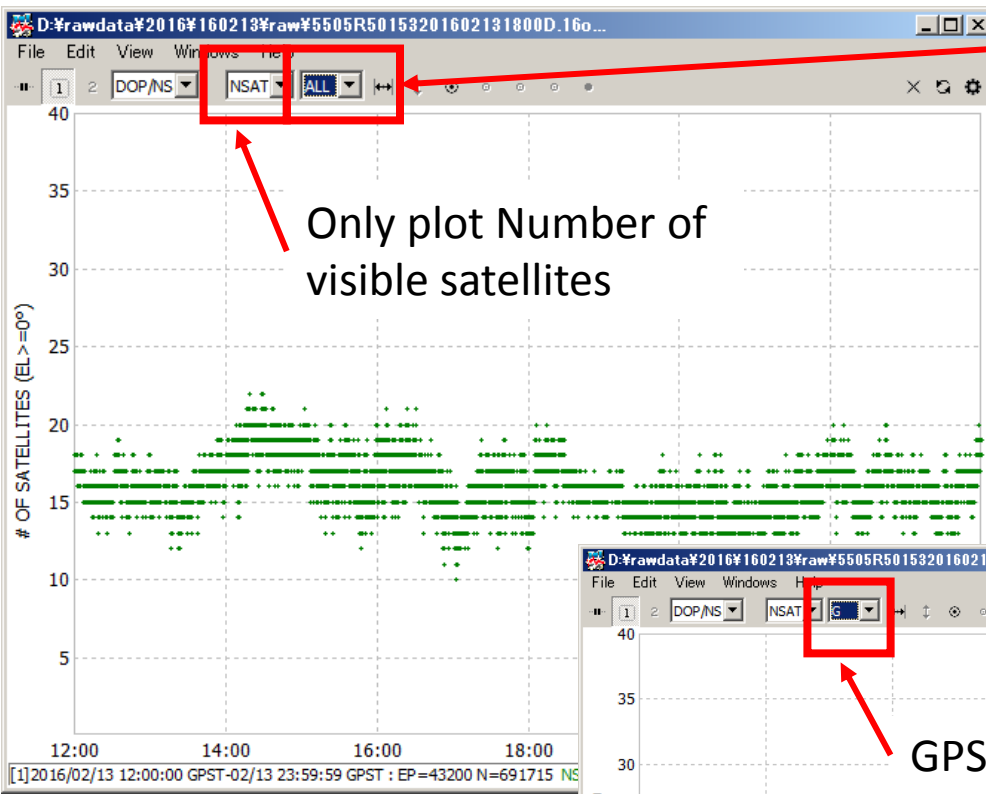
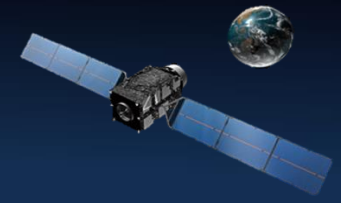
L1 signals for all satellites

Color indicating received frequencies



SNR Heat map

Number of Satellites and DOP



Number of Satellites and DOP (Change options)



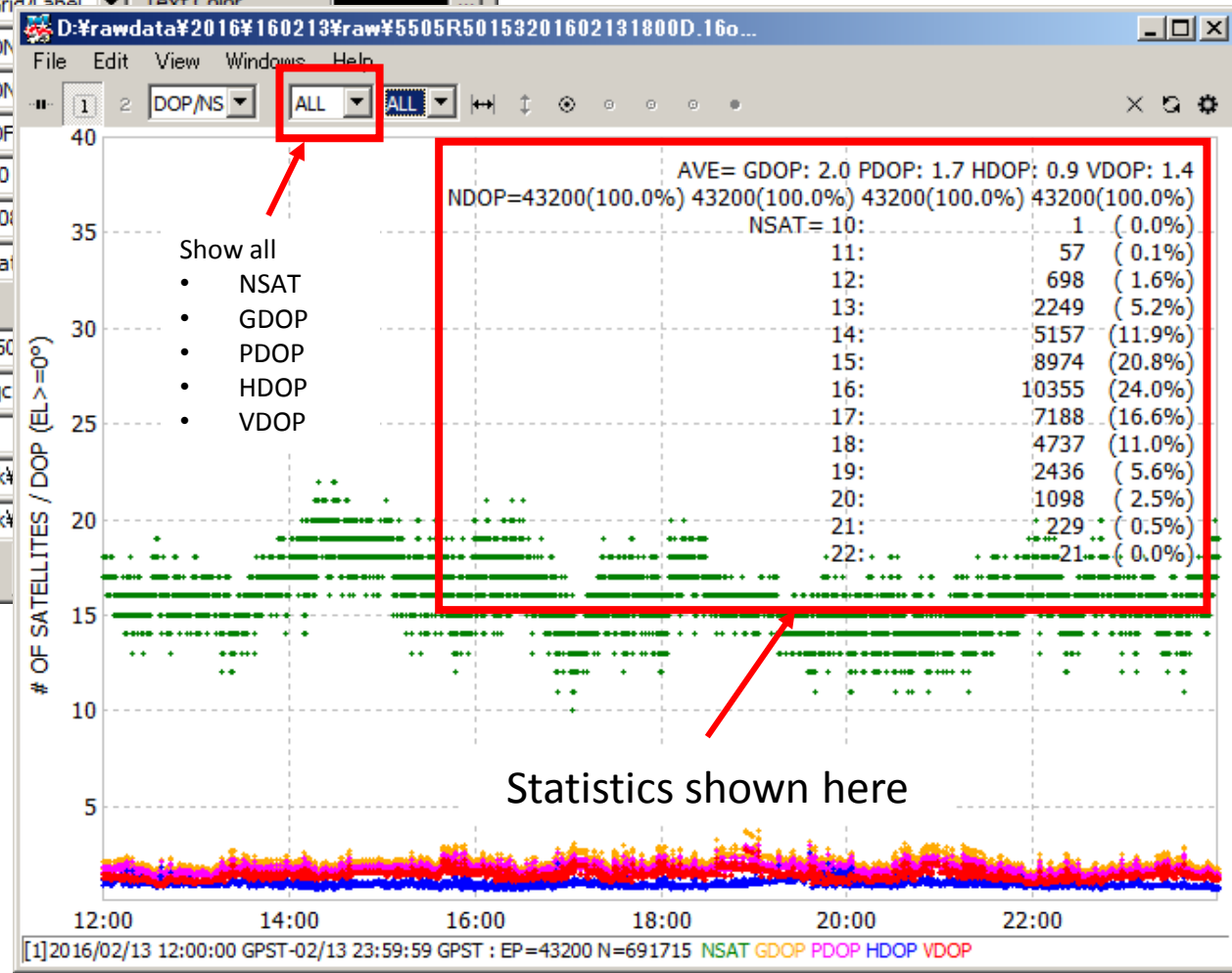
Options

Time Format: h:m:s GPST
 Lat/Lon Format: ddd dddd
 Show Statistics: **ON**
 Cycle-Slip: OFF
 Parity Unknown: OFF
 Ephemeris: OFF
 Elevation Mask (°): 0
 Elev Mask Pattern: OFF
 Hide Low Satellite: OFF
 Max NSAT/DOP: 40
 Max Multipath: 10
 Receiver Position: Lat/Lon/Hg
 Satellite System:
 GPS GLO Galileo
 QZSS SBAS BeiDou
 Excluded Sats: 0 (+Sn: Included)

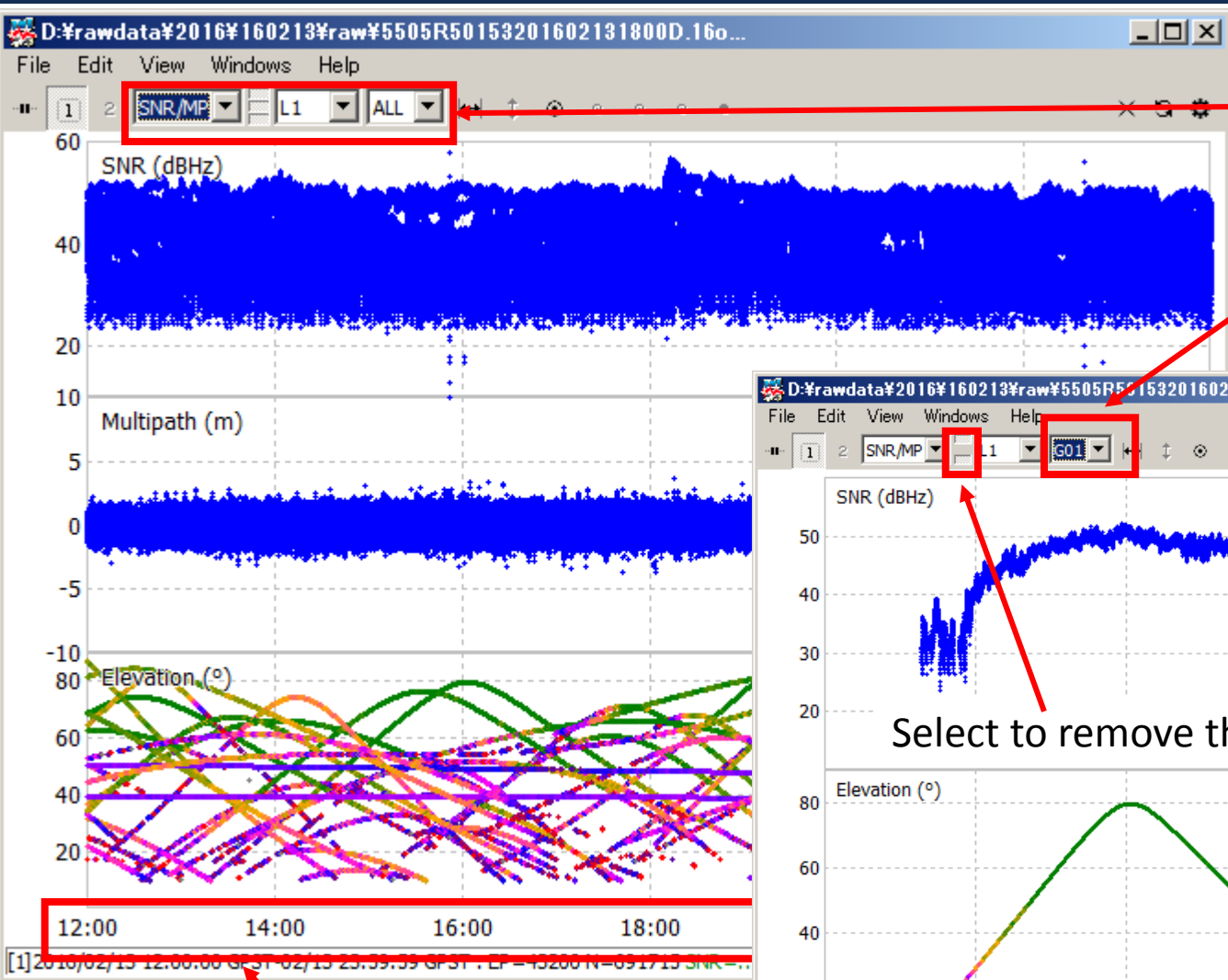
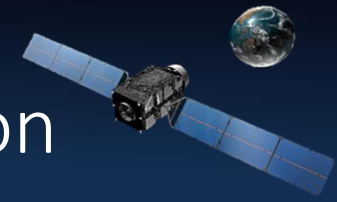
Error Bar/Circle: OFF
 Direction Arrow: OFF
 Graph Label: ON
 Grid/Grid Label: ON
 Compass: ON
 Scale: ON
 Auto Fit: OFF
 Y-Range (+/-): 50
 RT Buffer Size: 100
 Coordinate Origin: Lat

Mark Color 1 (1-6): [Color palette]
 Mark Color 2 (1-6): [Color palette]
 Line Color: [Color palette]
 Text Color: [Color palette]

Select On to Show statistics

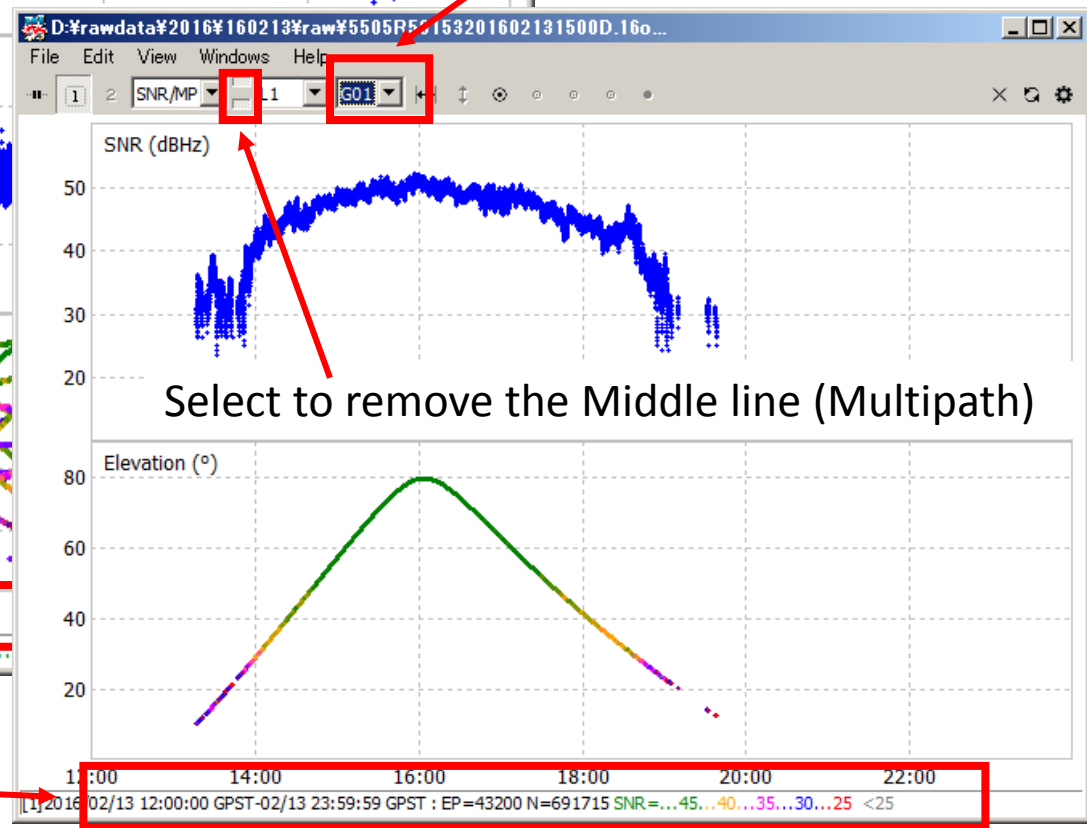


Signal to Noise Ratio / Multipath / Elevation



Select All satellites

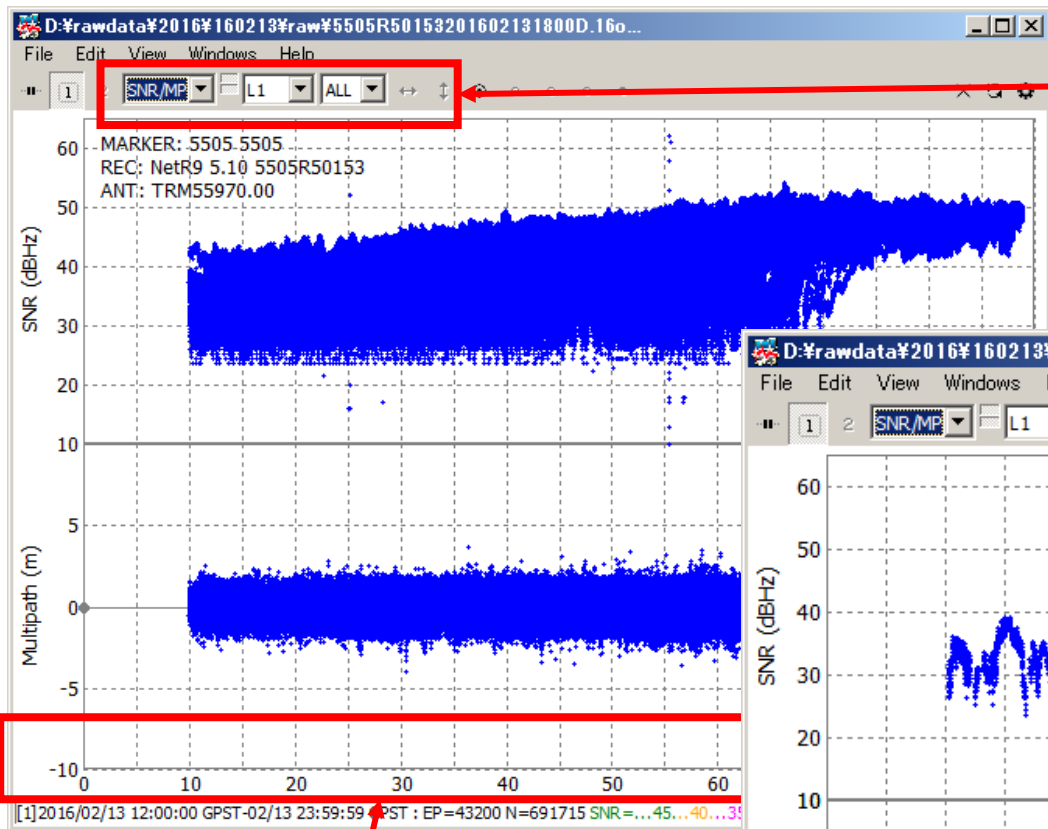
Select one satellite (G01)



Select to remove the Middle line (Multipath)

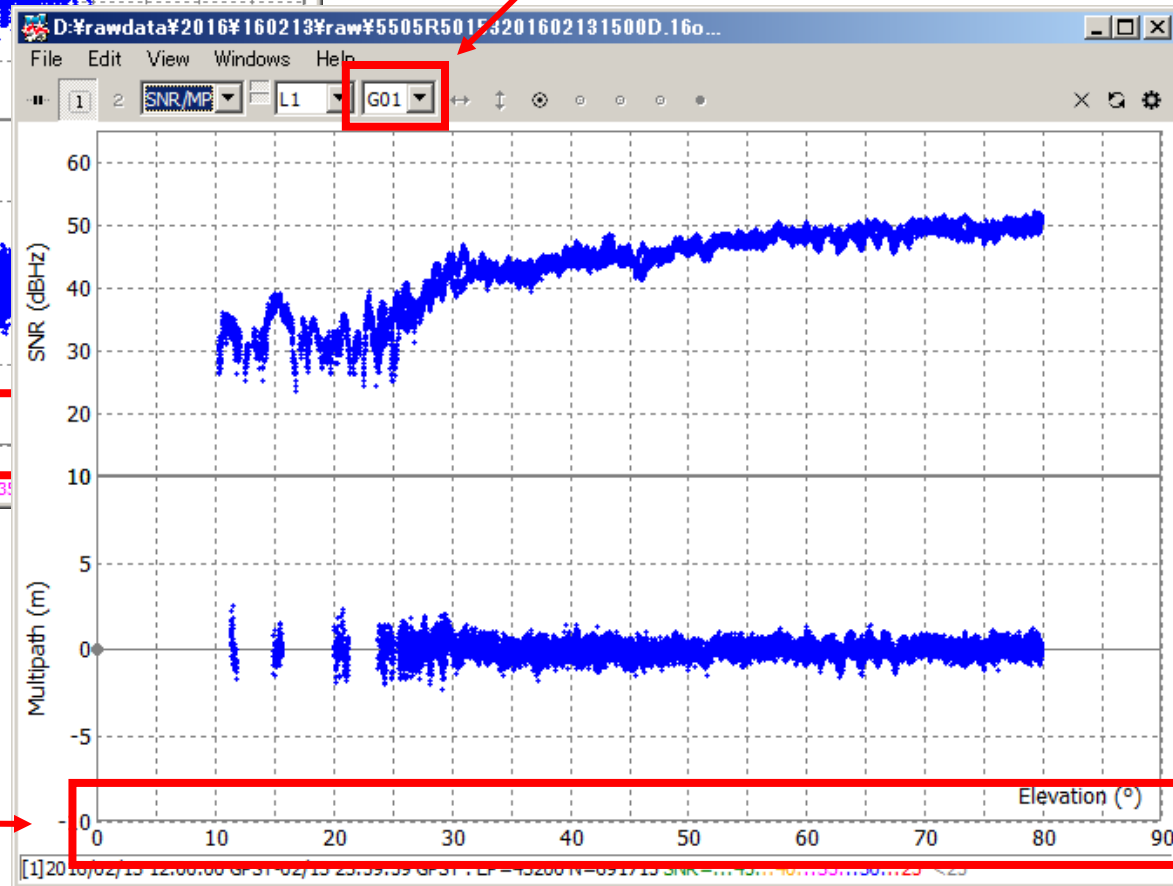
Time series

Signal to Noise Ratio / Multipath vs Elevation



Select All satellites

Select one satellite (G01)



Elevation