

7^{ème}
Rencontre Spatial Radioamateur



 **Electrolab**

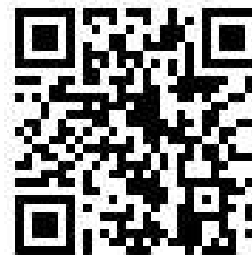
HACKERSPACE @NANTERRE

Réception de satellites Bande L

Bernard F6BVP

Association Dimension Parabole

Radio Club F4KLO – AL REF 75





Association Dimension Parabole Radio Club F4KLO

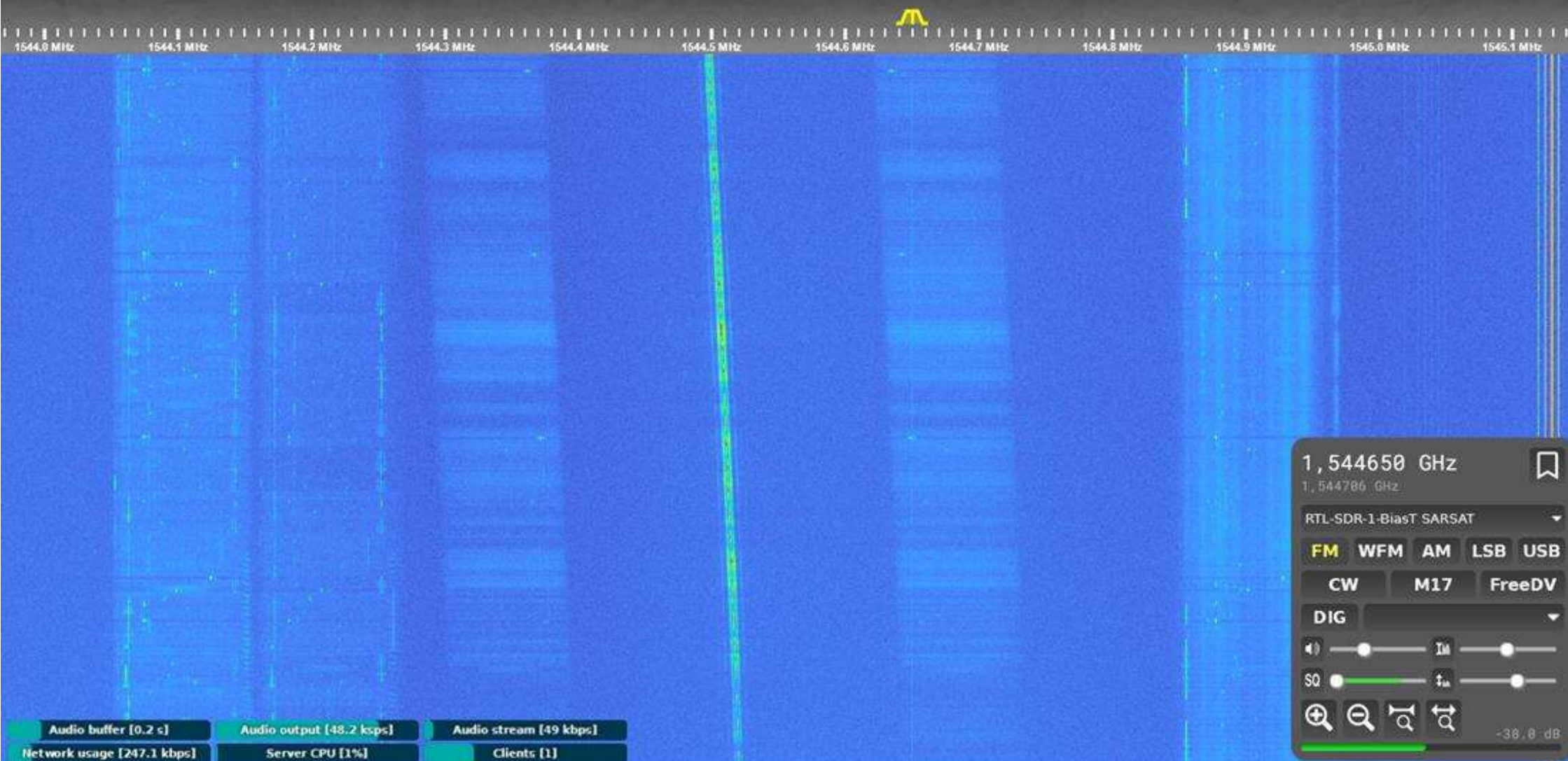


F4KLO

04-03-2024 Mon 08:42:33

Diamètre 10m
f/D 0,43
Gain théorique 40 dB
Source septum
Polarisation circulaire
Rx / Tx 1296 MHz
Lobe principal 1,5°
Rx 1420,4 raie H
Opérations à distance





Satellites de recherche et sauvetage SARSAT

Le système Cospas-Sarsat est composé :

- .de balises de détresse à 406 MHz utilisées à bord des navires (EPIRB ou RLS), des aéronefs (ELT), comme balises de localisation personnelle (PLB) ;
- .de balises d'alerte de sûreté des navires (SASS) ;
- .de satellites en orbite polaire basse du système LEOSAR et de satellites géostationnaires du système GEOSAR ;
- .stations terriennes de réception LEOLUT, GEOLUT, Centres de contrôle de mission (MCC).

BALISES de détresse



Emplacement d'une balise ELT à bord d'un avion.



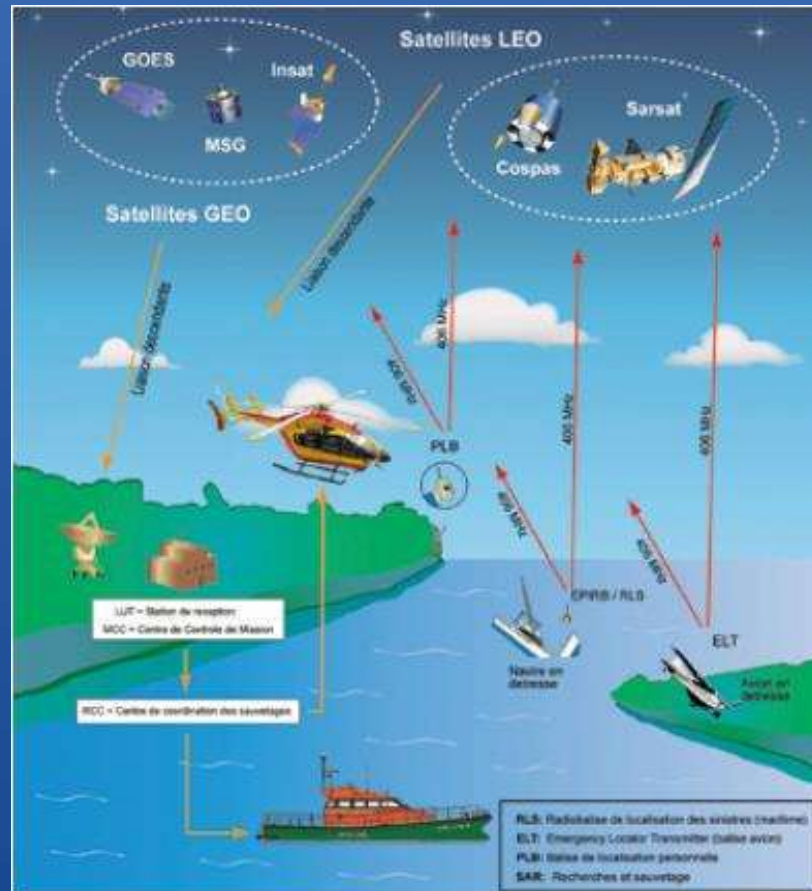
Balise EPIRB avec logement dont l'ouverture et la libération est déclenchée automatiquement en cas de submersion détecté par un largeur hydrostatique. Sur la ph

Balise comportant un GPS interne permettant l'envoi

Aperçu du système COSPAS-SARSAT



MEOSAR

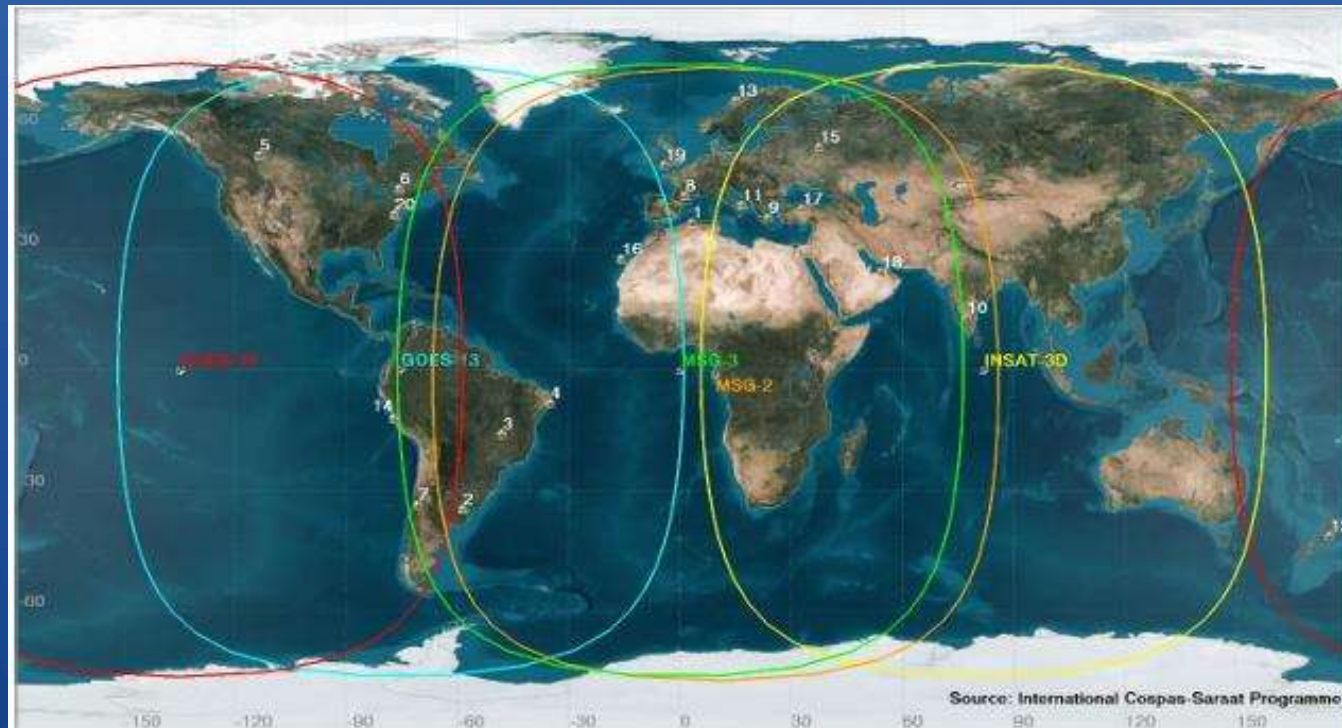


<https://youtu.be/ZJ3SsPDUKZI>

GEOSAR

.MSG-3 263 (9.5° E) F

.MSG-4 264 (0°) F Subject to periodic manoeuvres.



Search And Rescue SAT

- Les signaux retransmis par les satellites vers la Terre (LUT) :
- Les signaux 406 MHz reçus par les satellites sont retransmis vers la Terre en bande L : 1 544,5 MHz.
- La bande 1 544/1 545 est divisée en sous bandes :
 - - 100 kHz centrés sur 1 544,5 MHz s/bde LEOSAR : NOAA METOP.
 - - 100 kHz centrés sur 1 544,1 MHz s/bde MEOSAR : GALILEO etc.
 - - 100 kHz centrés sur 1 544.9 MHz s/bde MEOSAR : GPS GLO

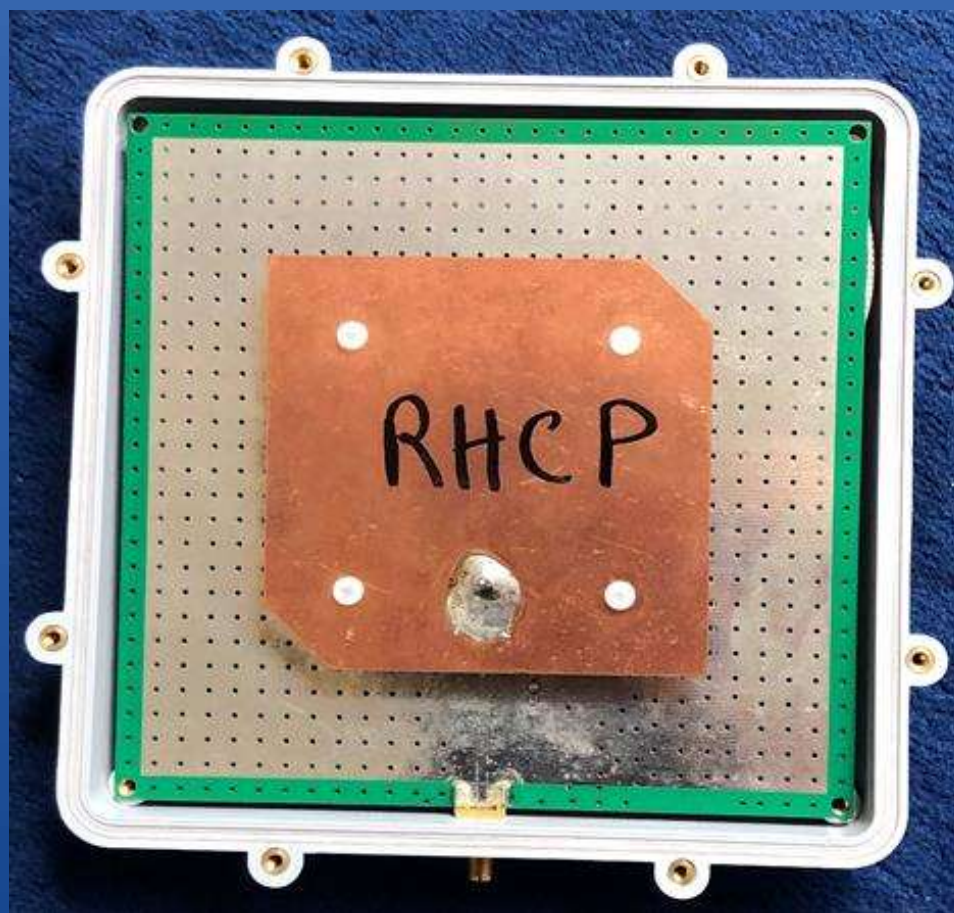
Satellites bande L

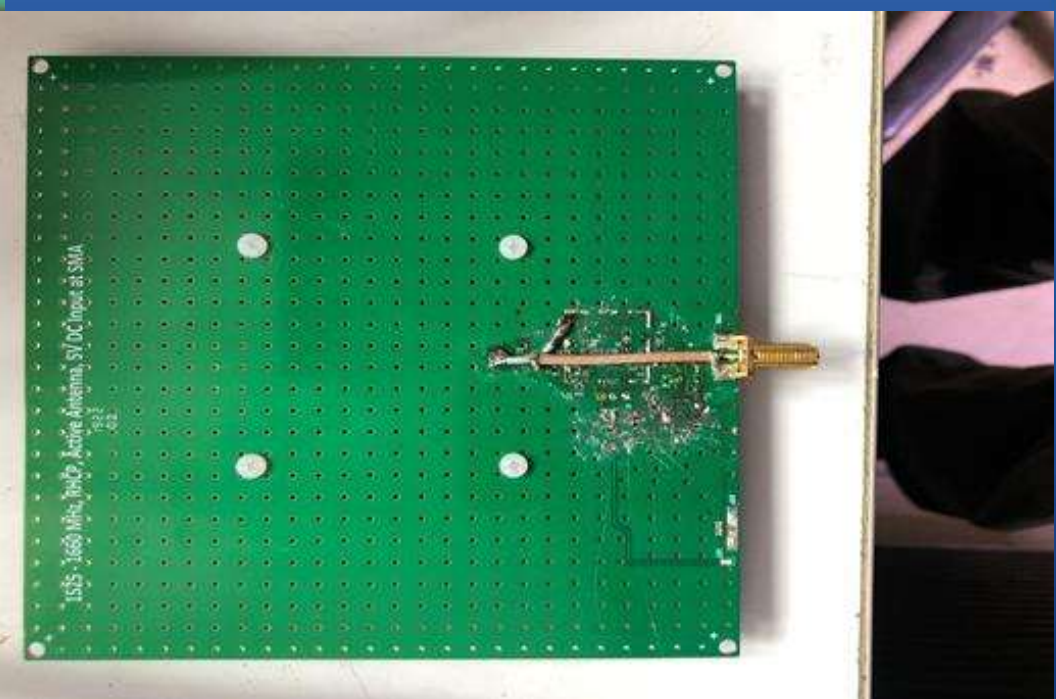
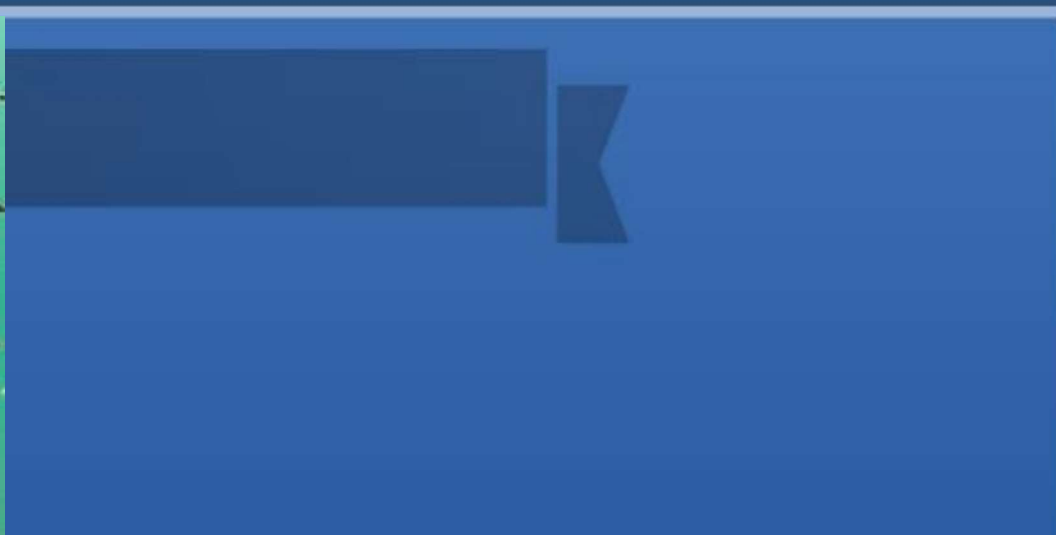
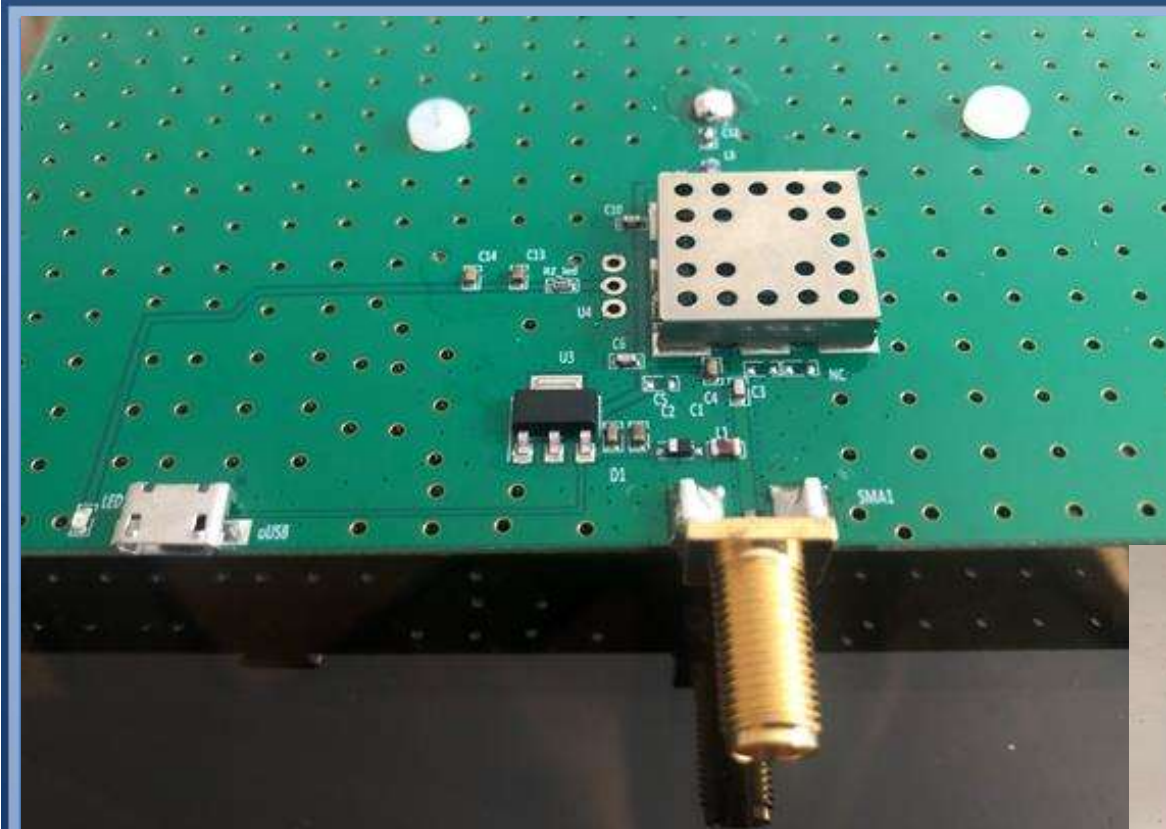


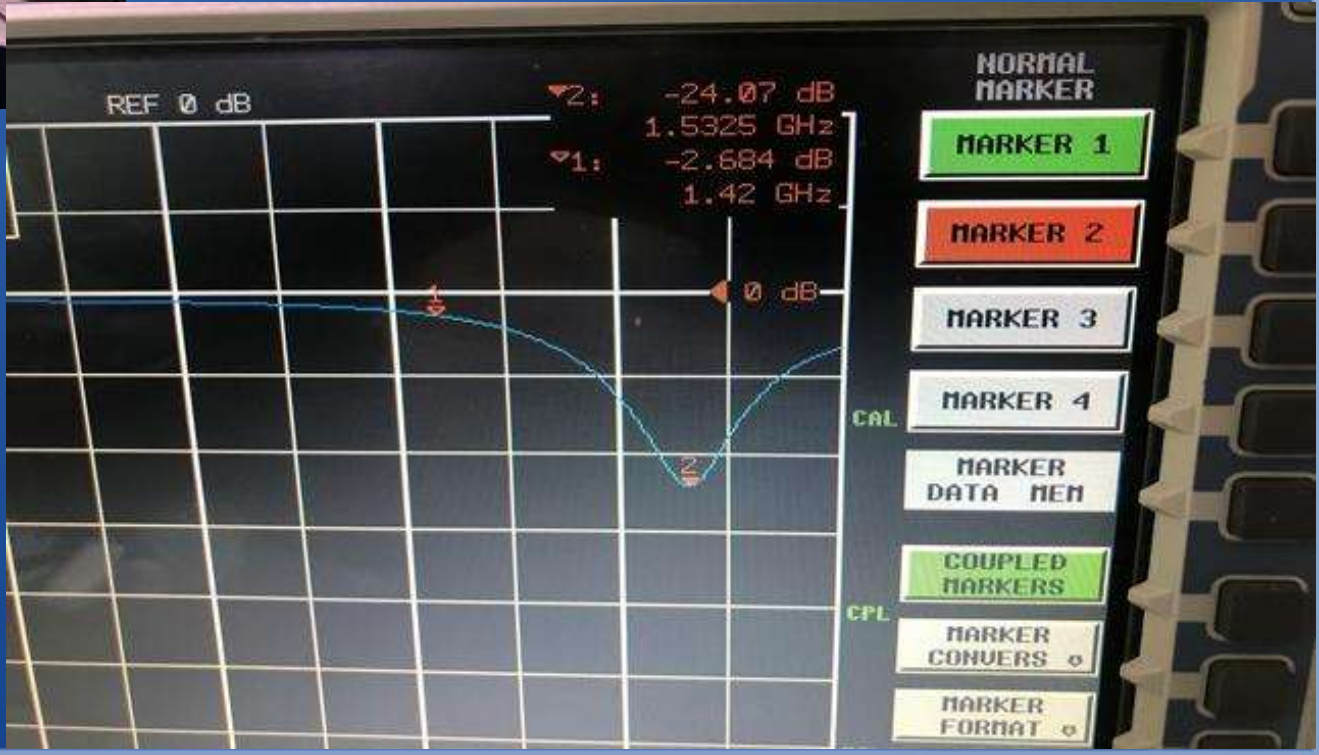
- .NOAA météo HRPT 1698 MHz
- .Inmarsat (télécom)
- .GPS Galileo Glonass Beidou
- .Iridium téléphonie
- .WorldSpace (radio par sat)
- .Antenne patch 1525 à 1660 MHz

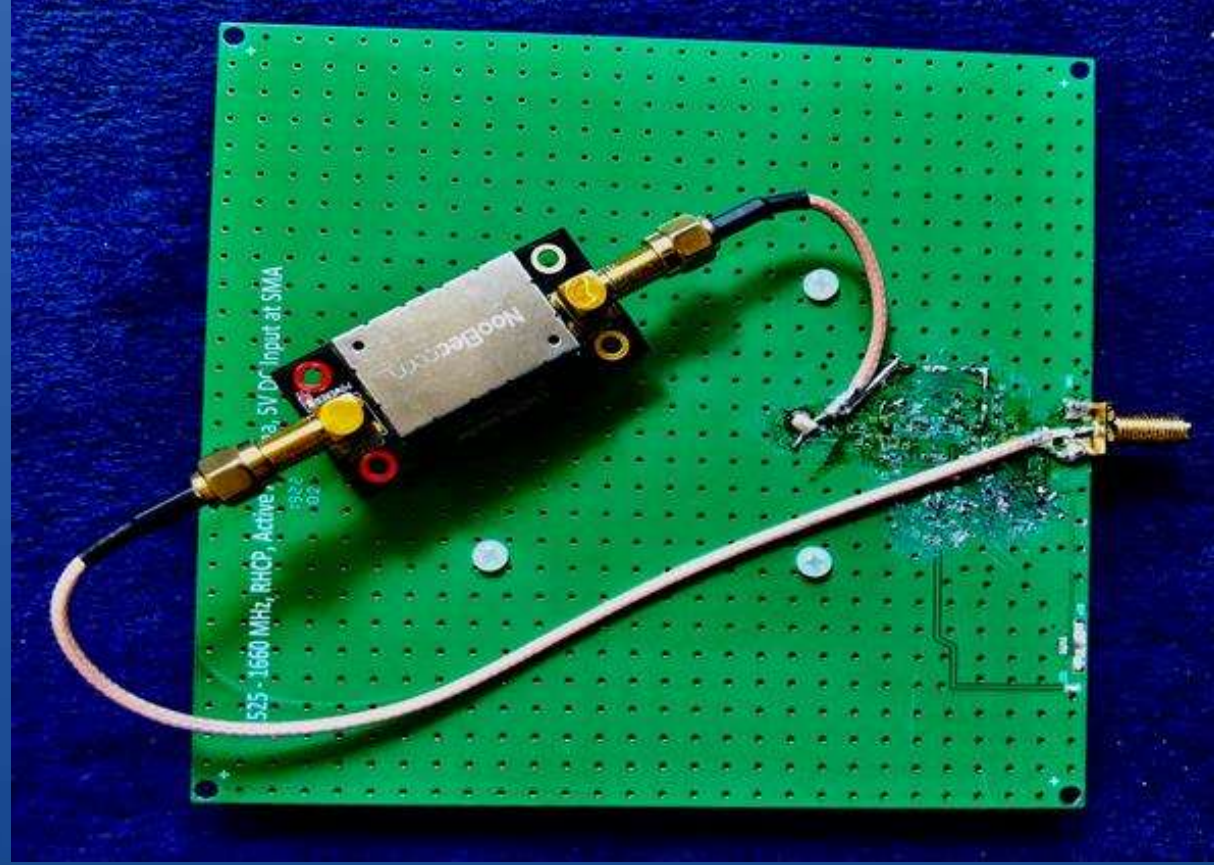


Association Dimension Parabole
Radio Club F4KLO
Réception de satellites bande L









F4KLO
OpenWebRX



F4KLO

Paris, France | Loc: JN18ev, ASL: 60 m

16-03-2023

F6BVP



1544.0 MHz

1544.5 MHz

1545.0 MHz

Gpredict: GALILEO [min] [max] [close]

Fichier Édition Aide

GALILEO SARSAT NOAA INMARSAT

2023/11/20 12:26:19 [menu]

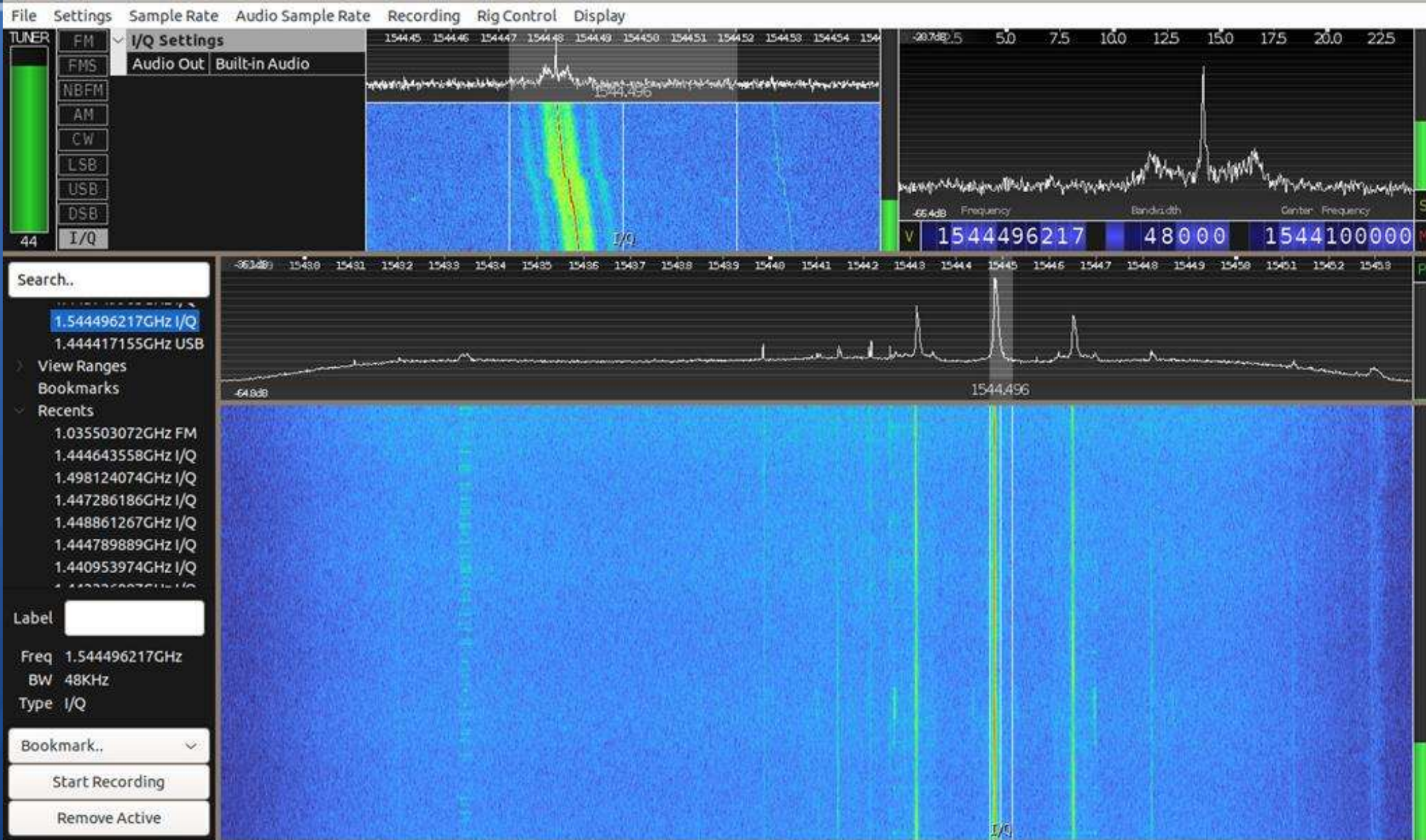
F4KLO. Prochain: GSAT0201 (PRN E18) dans 07:52



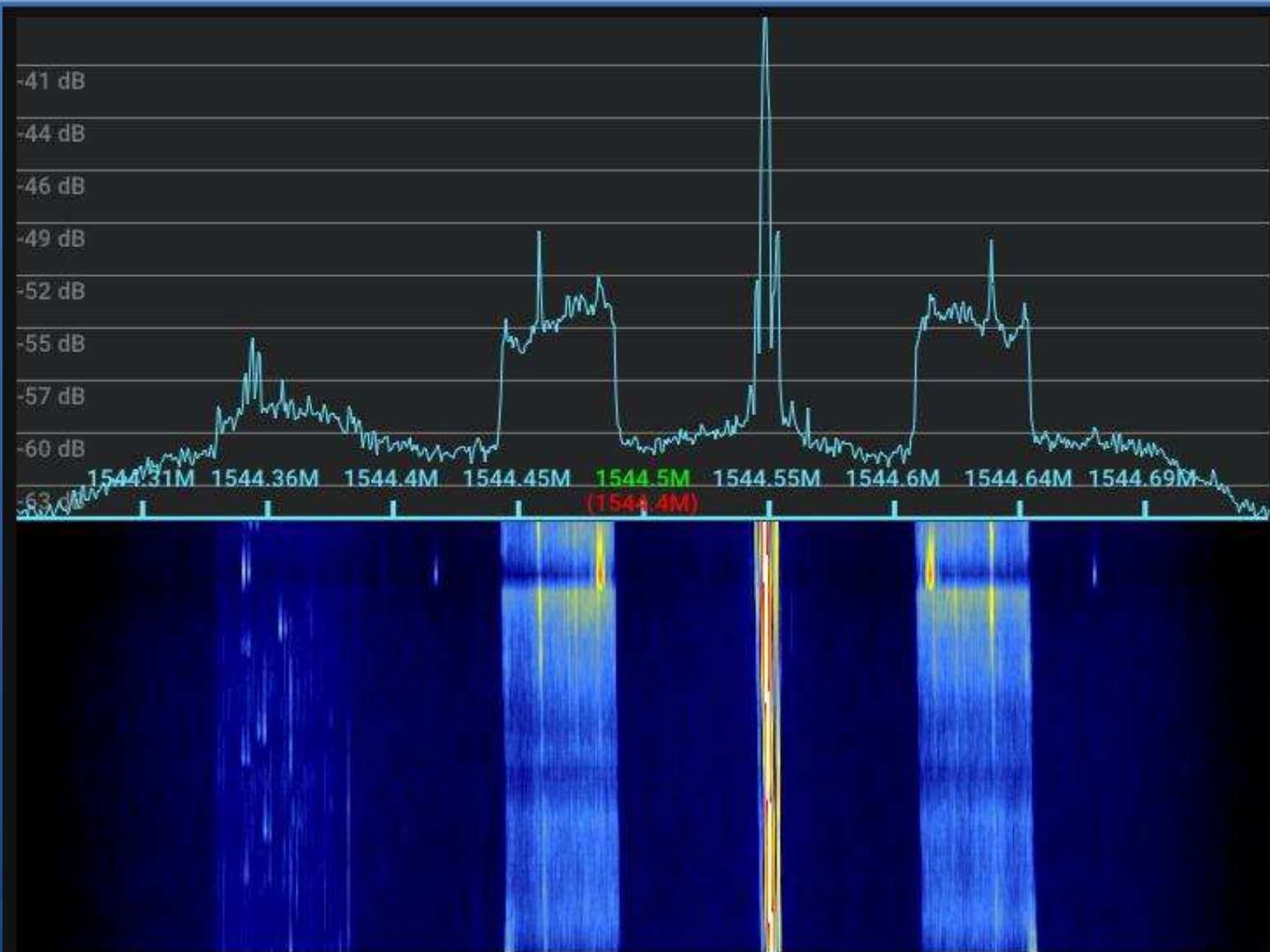
GSAT0201 (PRN E18)
GSAT0202 (PRN E15)
GSAT0203 (PRN E21)
GSAT0204 (PRN E34)
GSAT0205 (PRN E09)
GSAT0206 (PRN E11)
GSAT0207 (PRN E13)
GSAT0208 (PRN E14)
GSAT0209 (PRN E16)
GSAT0210 (PRN E17)
GSAT0211 (PRN E19)
GSAT0212 (PRN E20)
GSAT0213 (PRN E22)
GSAT0214 (PRN E23)
GSAT0215 (PRN E24)
GSAT0216 (PRN E25)
GSAT0217 (PRN E26)
GSAT0218 (PRN E27)
GSAT0219 (PRN E28)
GSAT0220 (PRN E29)
GSAT0221 (PRN E30)
GSAT0222 (PRN E31)
GSAT0223 (PRN E32)
GSAT0224 (PRN E33)
GSAT0225 (PRN E35)
GSAT0226 (PRN E36)
GSAT0227 (PRN E37)
GSAT0228 (PRN E38)
GSAT0229 (PRN E39)
GSAT0230 (PRN E40)

GSAT0209 (PRN E09)

Azimut : 306,32°
Élévation : 73,31°
Asc. droite : 208,43°
Déclinaison : 56,47°
Slant Range : 23444 km
Prochain événement : LOS: 2023/11/20 13:05:00
SSP Loc : IO15TH
Empreinte terrestre : 17268 km
Altitude : 23231 km

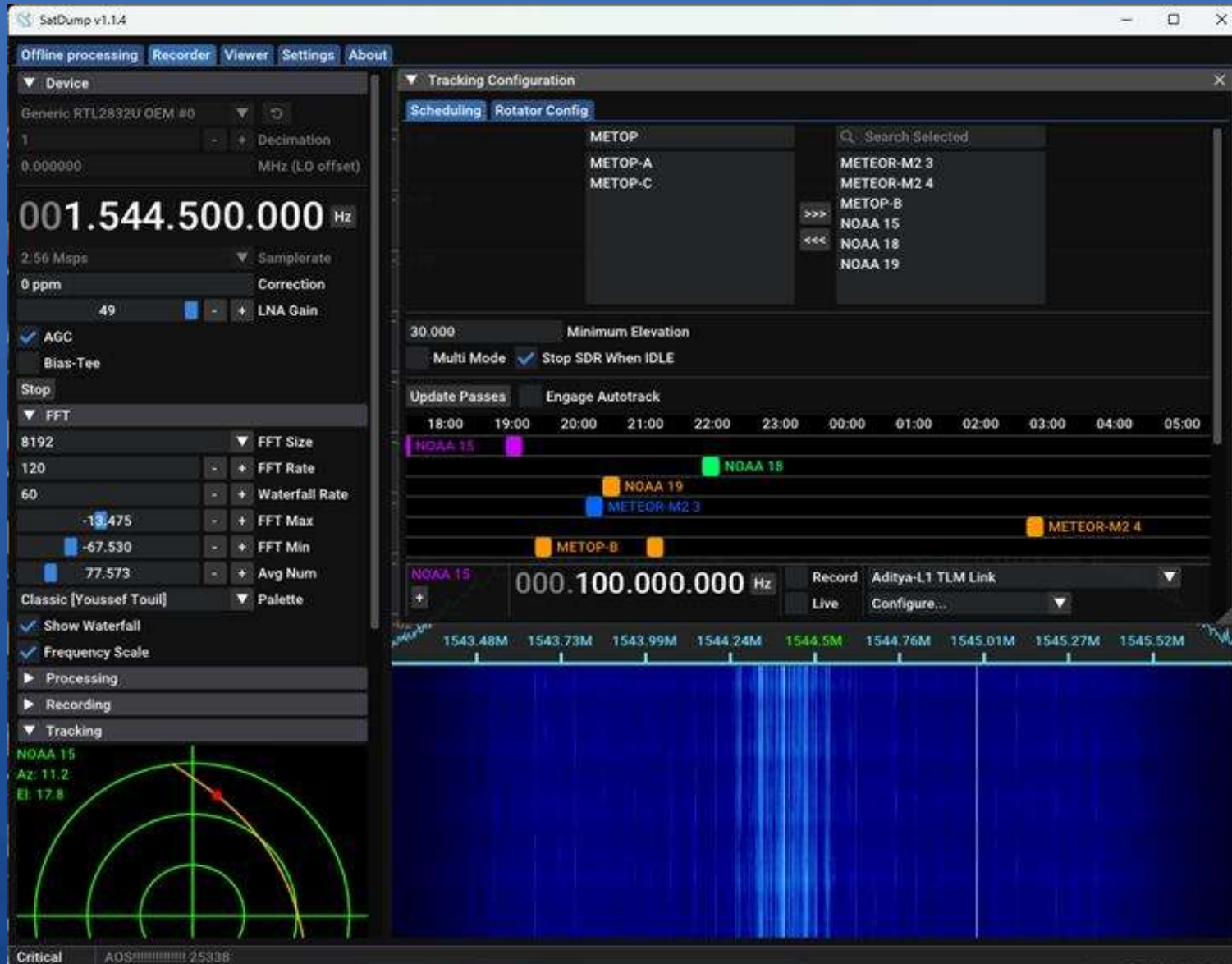


Displaying spectrum of active demodulator.



SatDump
Alan F4LAU







SatDump v1.1.4

Offline processing Recorder Viewer Settings About

☐ Show Waterfall

☒ Frequency Scale

☐ Processing

☐ Recording

☐ Tracking

NOAA 15
Az: 137.1
El: 44.6



LOS in 00:09:10

☒ Satellites

☐ Horizons

NOAA 15

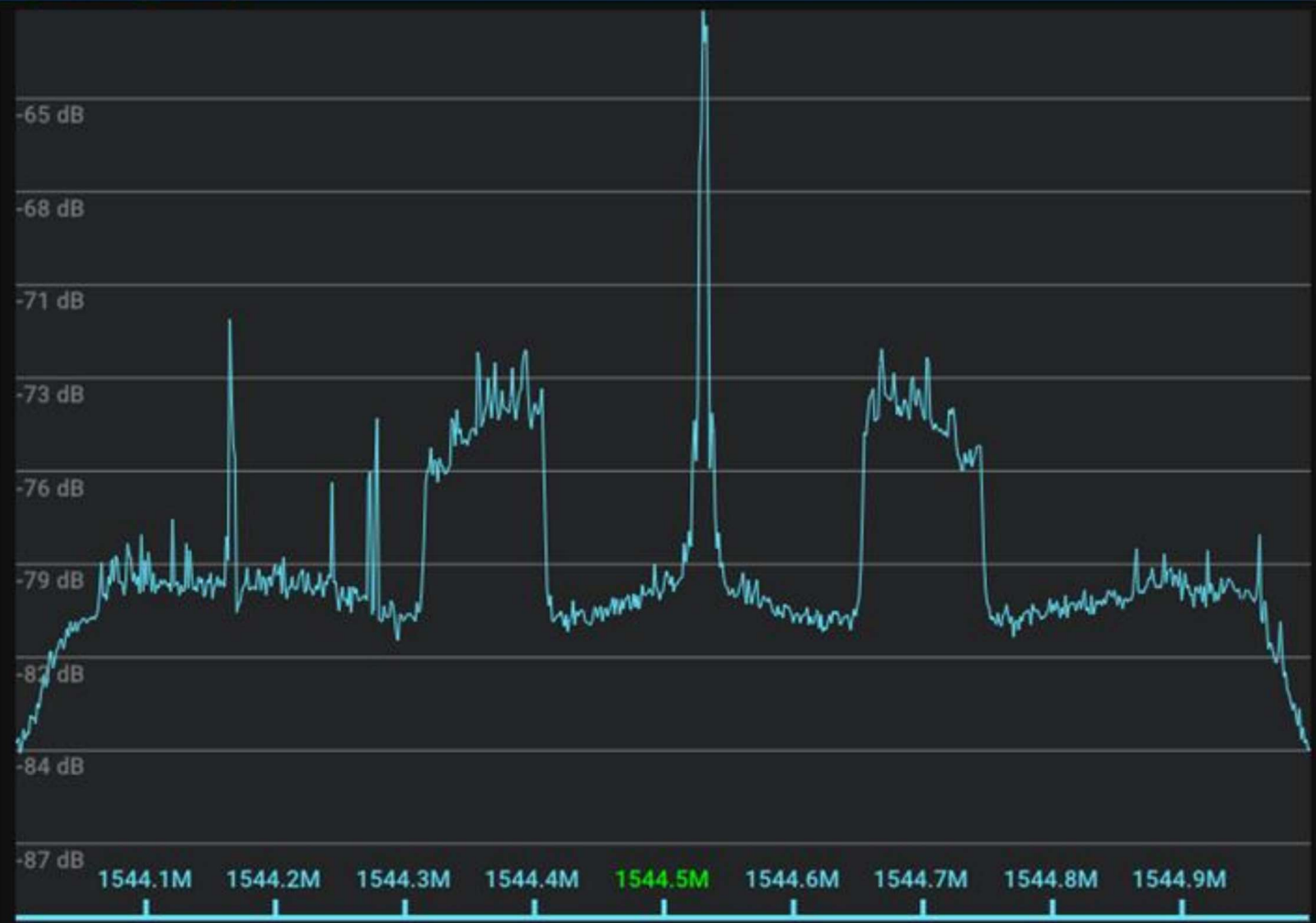
▼

☐ Object Information

☐ Rotator Configuration

☐ Schedule and Config

☐ Debug



Info Recording to /home/bernard/SatDump/enregistrements/2024-01-12_18-17-22_1000000SPS_1544500000Hz.wav

Options
 ID: Sarsat2400
 Title: SARSAT 1...auds beacon
 Author: Bernard F6BVP / AI7BG
 Description: After...euclid/
 Output Language: Python
 Generate Options: QT GUI

Variable
 ID: samp_rate
 Value: 2M

Variable
 ID: dec
 Value: 80

Variable
 ID: baudrate
 Value: 2.405k

Variable
 ID: sps
 Value: 10.395

Variable
 ID: tune_freq
 Value: 1.5445M

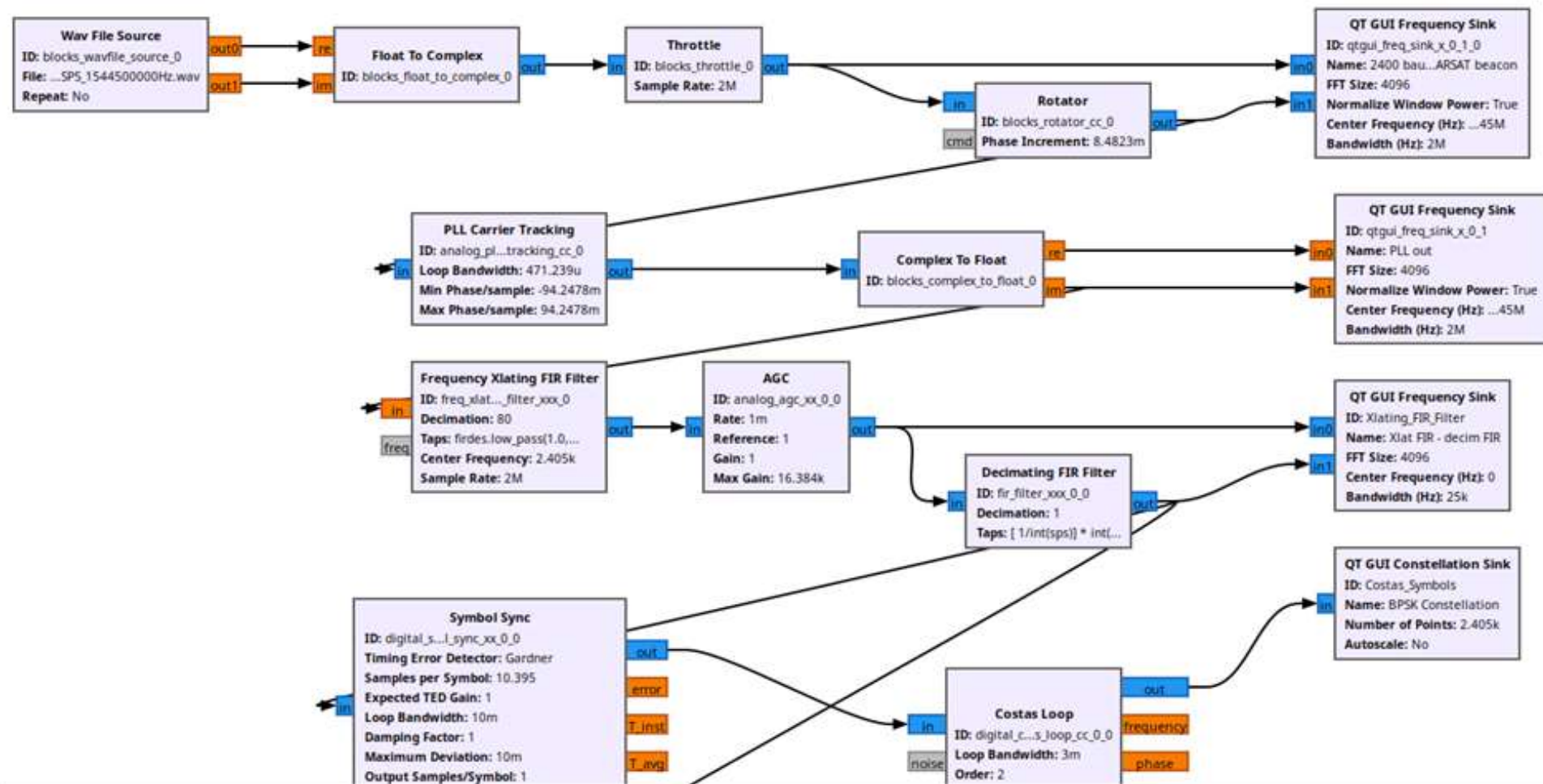
Variable
 ID: pll_bw
 Value: 150

Variable
 ID: pll_limit
 Value: 30k

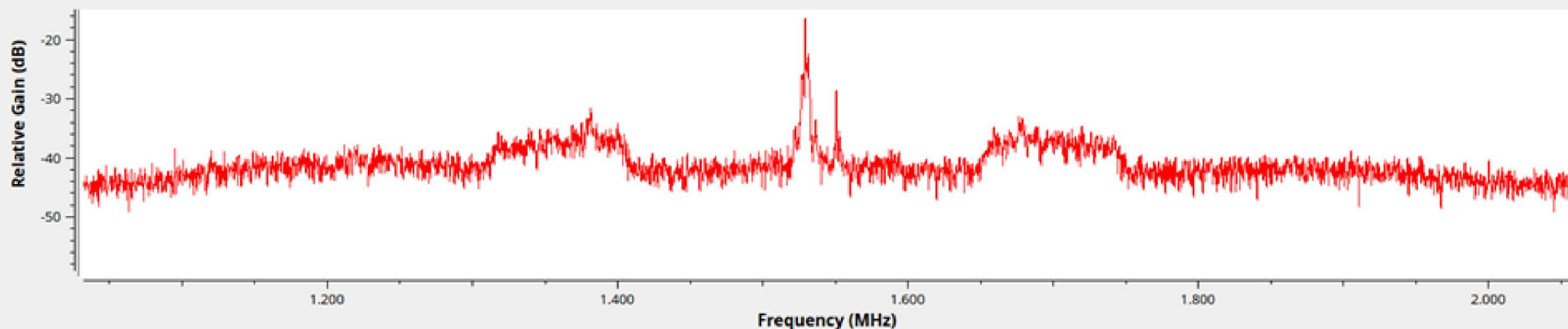
Import
 ID: import_1
 Import: np

Import
 ID: import_0
 Import: pi

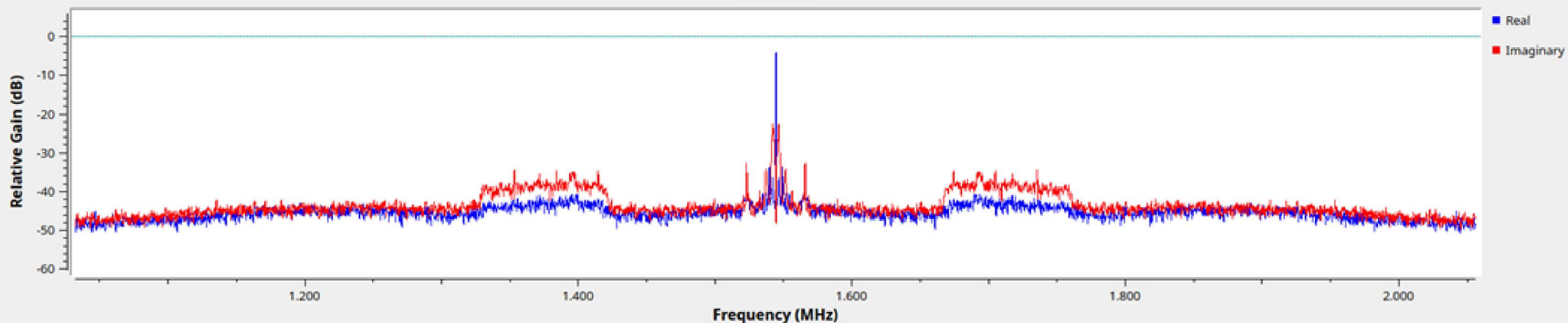
QT GUI Range
 ID: Local_Oscillator
 Default Value: 2.7k
 Start: -230k
 Stop: 230k
 Step: 10



SARSAT 1544.5 MHz SF=1024 KHz / 16 bits 2400 bauds beacon

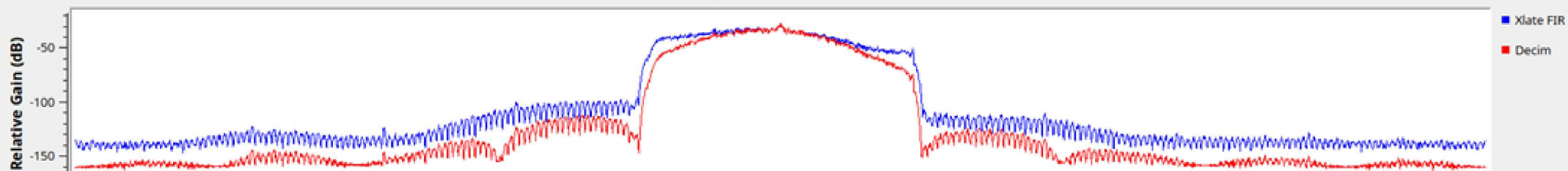


PLL out



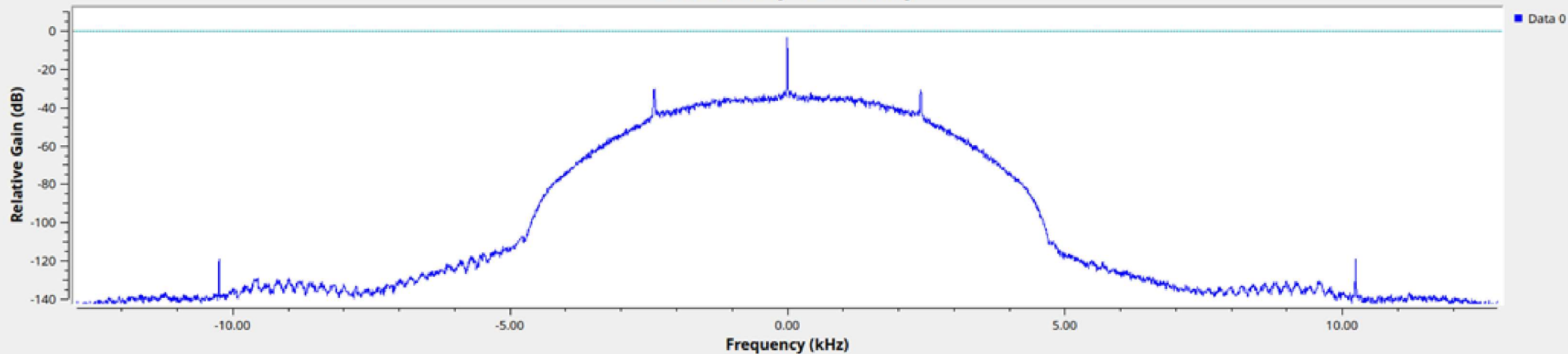
Frequency (MHz)

Xlat FIR - decim FIR

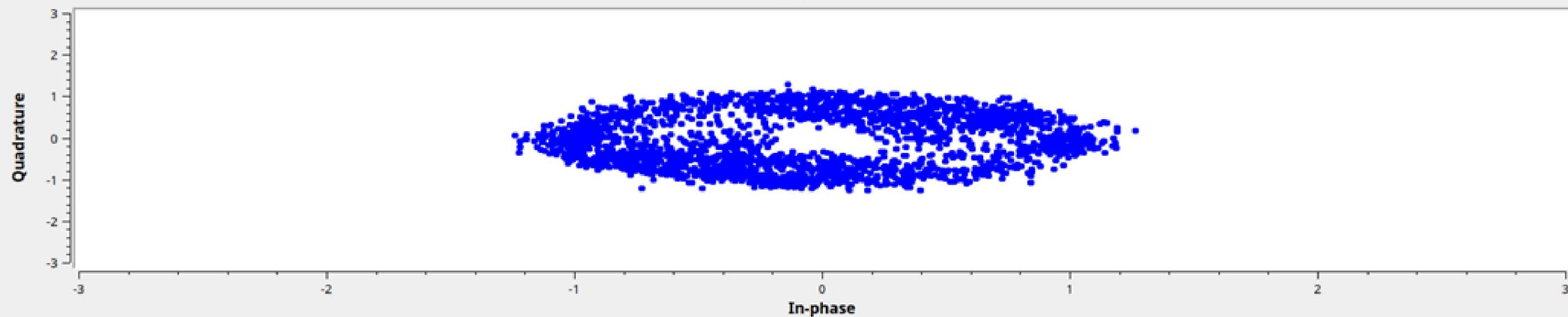


SARSAT 1544.5 MHz SF=1024 KHz / 16 bits 2400 bauds beacon

2400 bauds Cyclo-stationary



BPSK Constellation



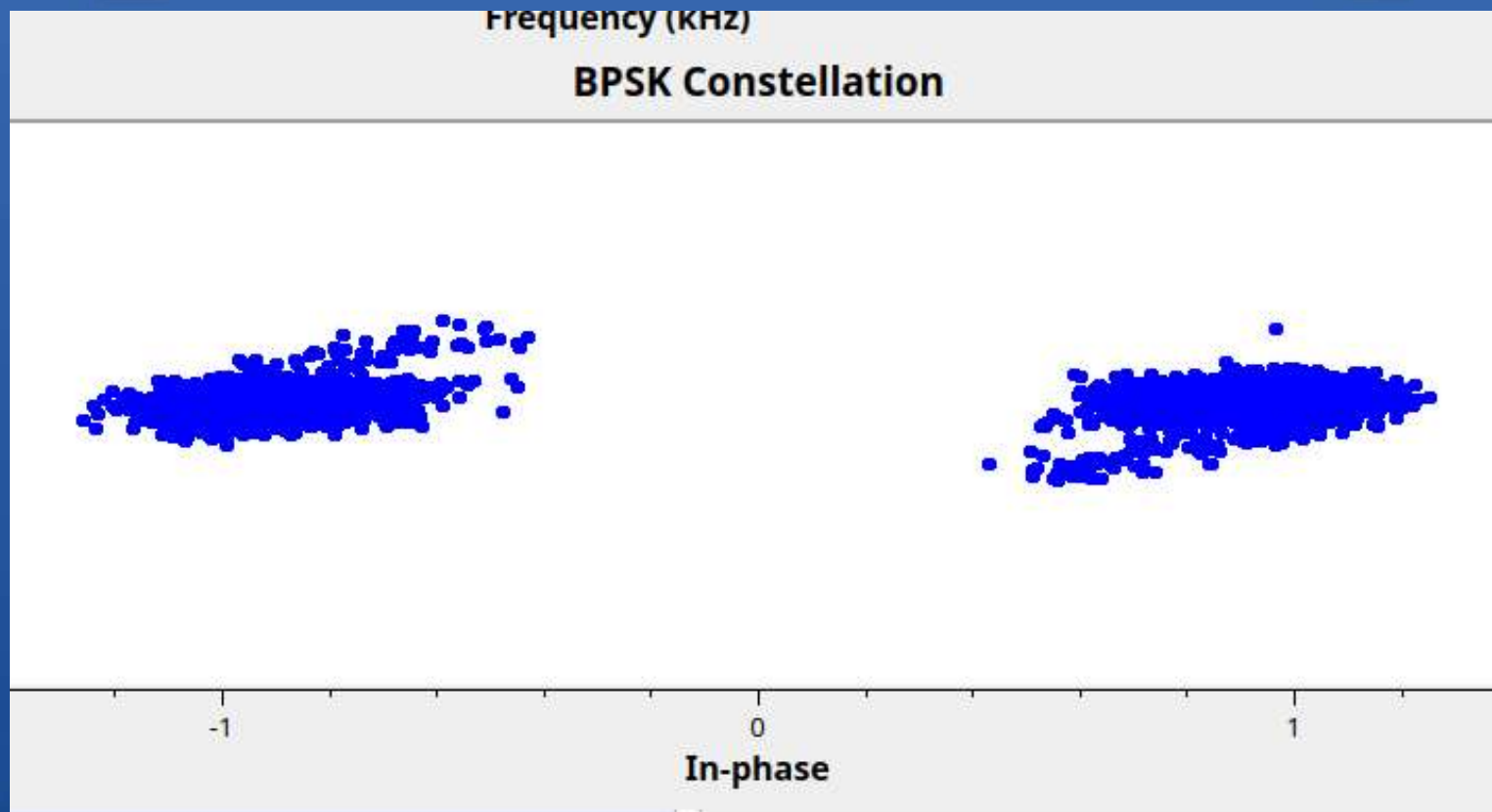
'baudrate' 2400

'doppler' 0

2400 bauds SARSAT beacon

Beacon Frequency

Constellation BPSK



Codage frames balises 406 MHz

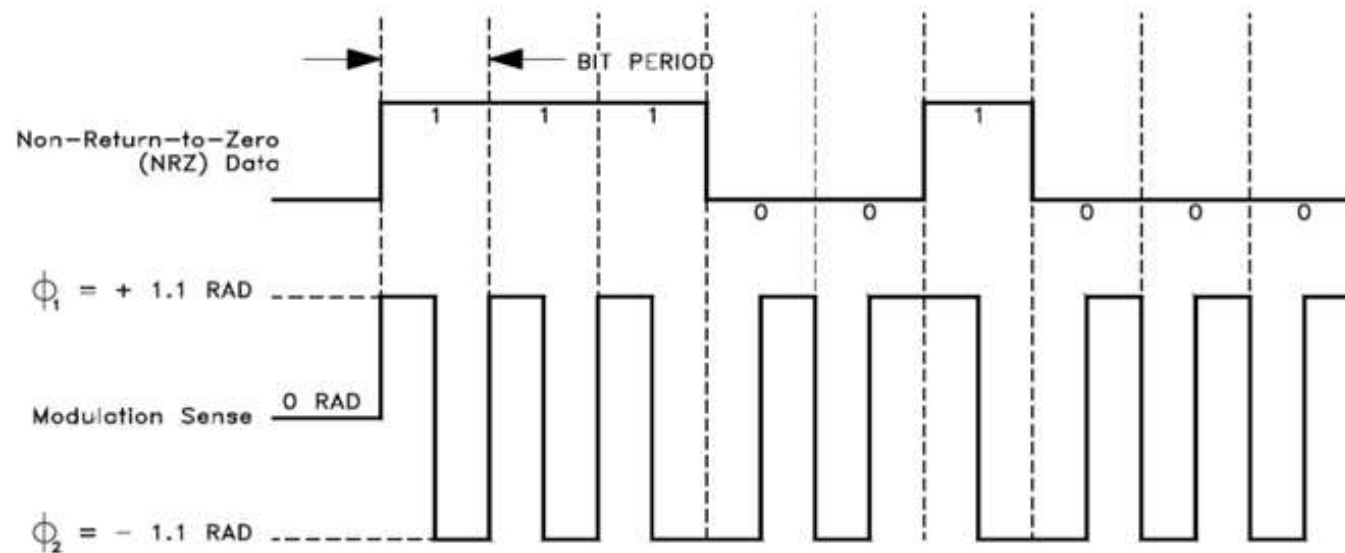
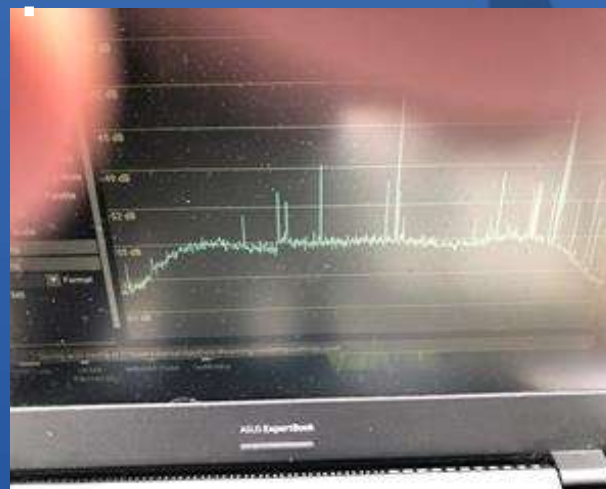
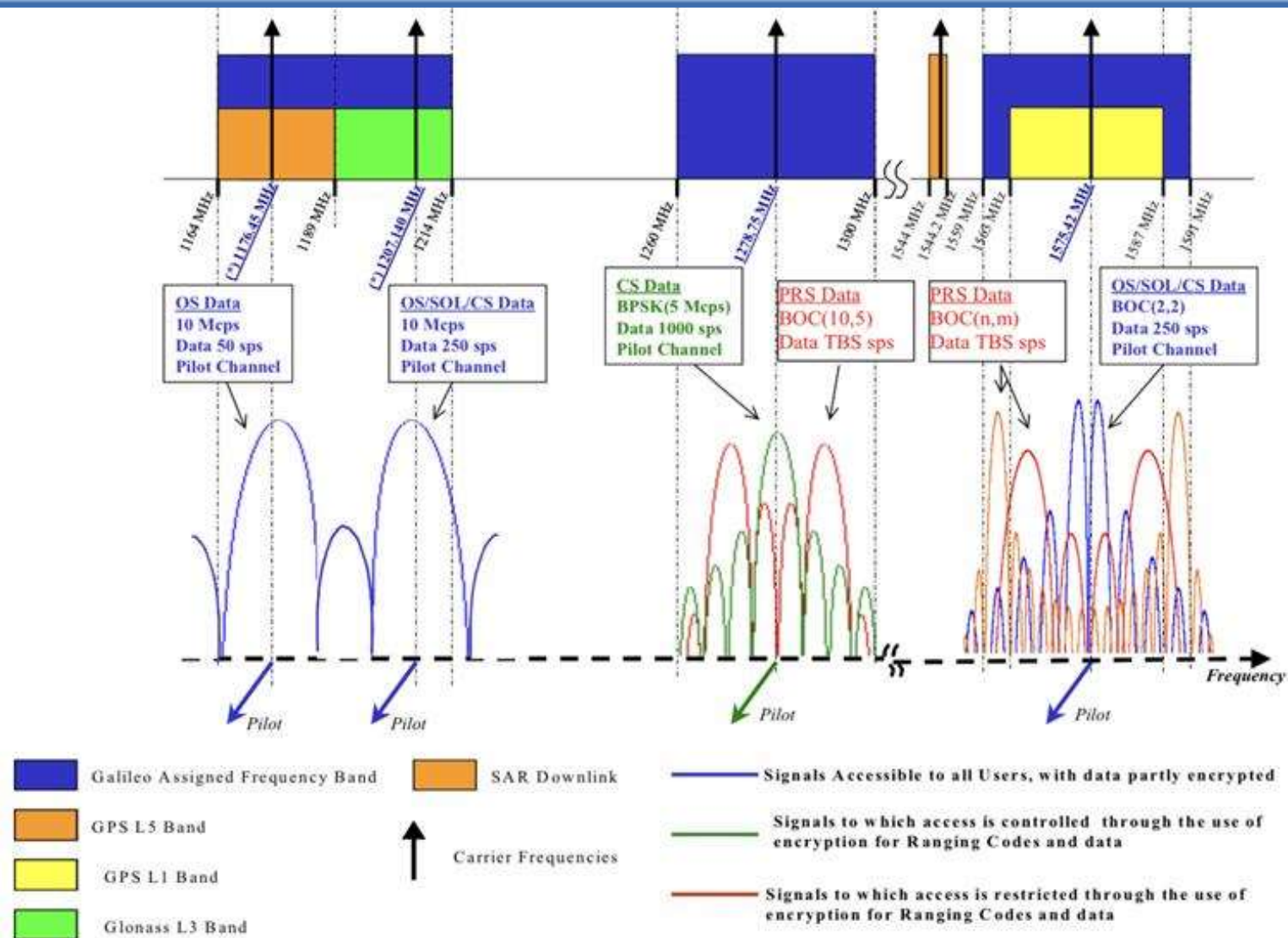


Figure 2.4: Data Encoding and Modulation Sense



Patch + parabole offset + gain ?



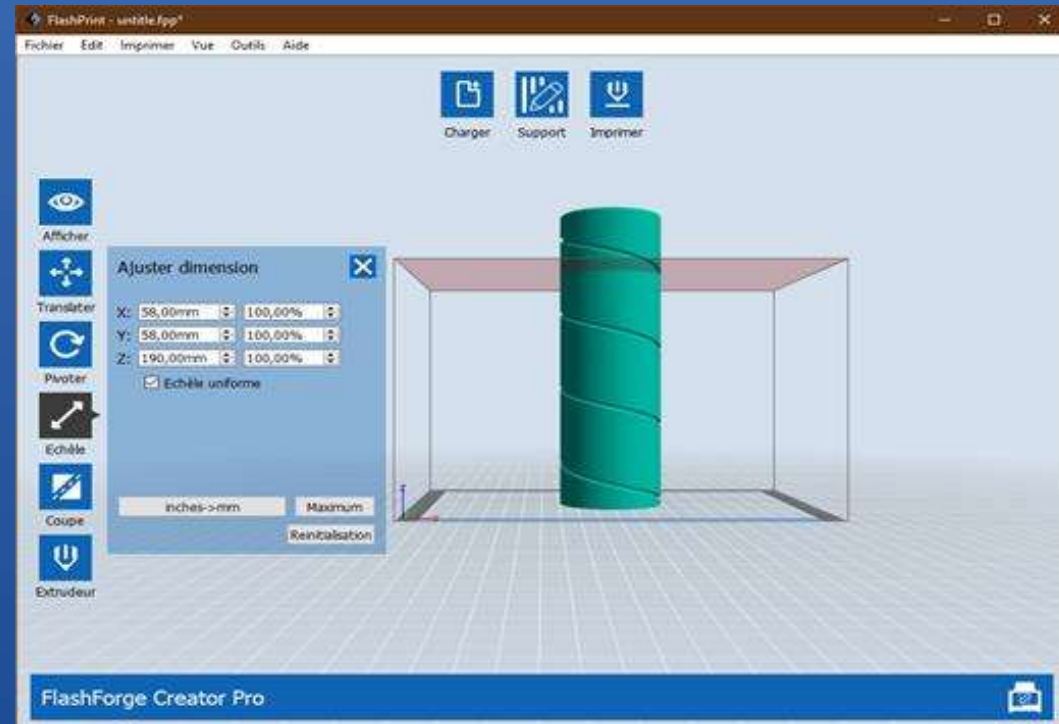
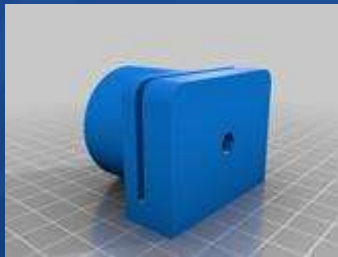
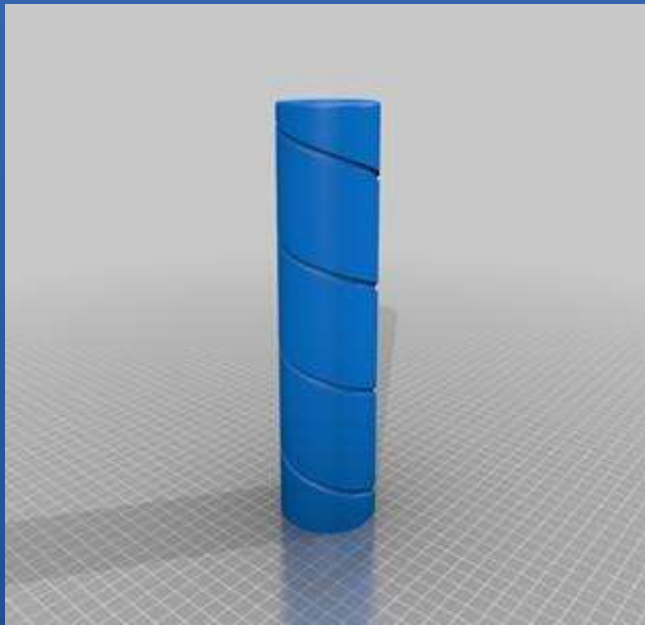


(*) In case of separate modulation of E5a and E5b signals

Figure 1. Galileo frequency spectrum



Antenne hélice 1545 MHz

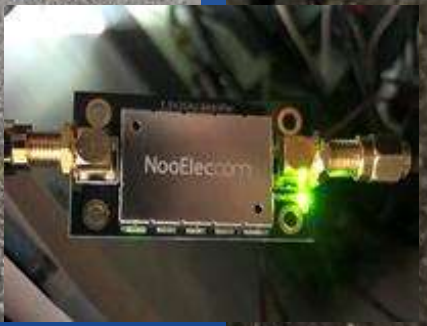




 **Electrolab**

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Radio Club F4KLO Parc de la Villette, Paris 19è



- Blog <http://radiotelescope-lavillette.fr>
- Chaîne Twitch TV https://www.twitch.tv/dimension_parabole
- site « temps réel » <http://f4klo.ampr.org/>
- Liste de contact liste@radiotelescope-lavillette.fr

