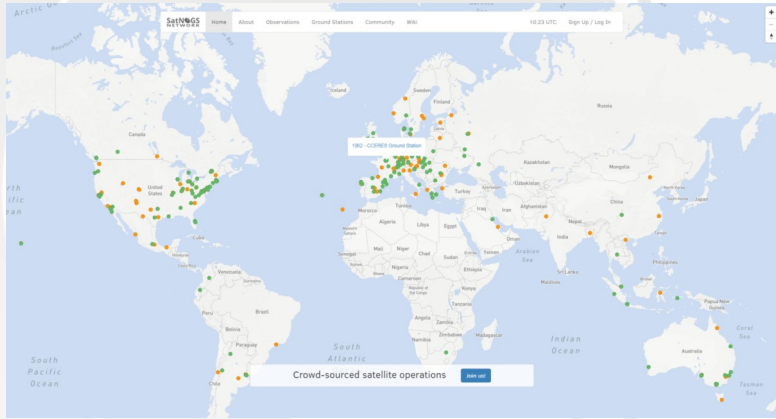




'New comer' ground station challenge : demodulate data

Louis Le Leuch, Romain Zida, Souwédou Silla Djibril
Dramane, Boris Segret
C2ERES, the space pole of PSL University Paris

Online OSCW, 12-13 dec. 2020



1062 - CCERES Ground Station

Owner	cceres_team
QTH Locator	JN18ct
Coordinates	48.807°, 2.229°
Altitude	120 m
Min Horizon	10°
Antennas	<input type="checkbox"/> Cross Yagi (UHF) <input type="checkbox"/> Cross Yagi (VHF)
Success Rate	<div style="width: 100%; height: 10px; background: linear-gradient(to right, green, red);"></div>
Observations	6042 View all
Creation Date	1 year, 2 months ago
Client version	0.9
Testing	Last seen 0 minutes ago
Uptime	428 days, 2:28:10 Log



Directional WIMO VHF 10 elements and WIMO UHF 18 elements crossed yagi antennas + circular polarization coupler + UHF MVV70cm LNA + Diplexer 2m/70cm + SDR Airspy R2. Rotator : Yaesu G-5500 + GS-232B. No LNA for VHF antenna at the moment (oct-2019).

CubeSat ↔ Ground Station ↔ SatNOGS Network & Dashboard

Observation #3265093

Timeframes are in UTC

Details

2020 - NOAA 15

Station 1062 - CCERES Ground Station

Observer Auto Scheduler

Status Good

Transmitter APT

Frequency 137.620 MHz

Mode APT

Timeframe 2020-12-08 07:53:05
2020-12-08 08:03:37

Rise 13.0°

Max 79.0°

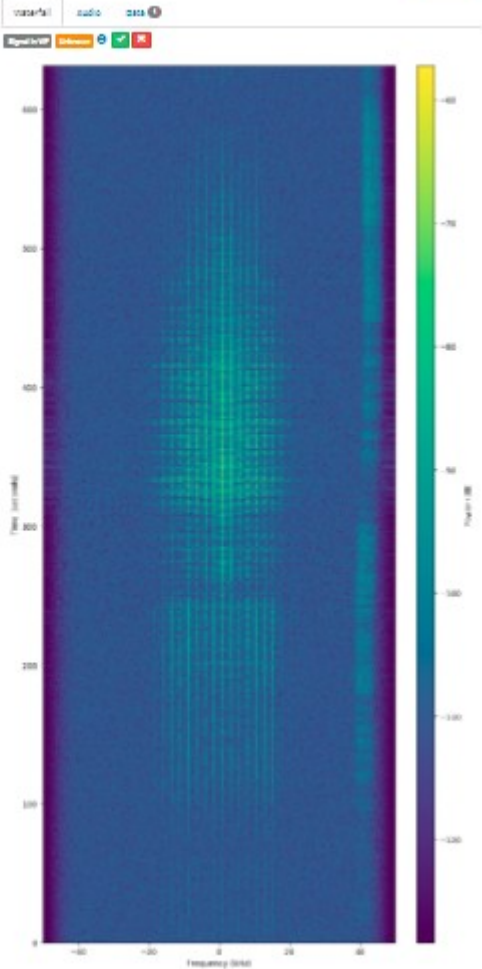
Set 202.0°

Client Version 0.9

Metadata { 5 items }

Polar Plot

Downloads



Observation #3265093

Timeframes are in UTC

Satellite 25338 - NOAA 15

Station 1062 - CCERES Ground Station

Observer Auto Scheduler

Status Good

Transmitter APT

Frequency 137.620 MHz

Mode APT

Timeframe 2020-12-08 07:53:05
2020-12-08 08:03:37

Rise 13.0°

Max 79.0°

Set 202.0°

Client Version 0.9

Metadata { 5 items }

Polar Plot

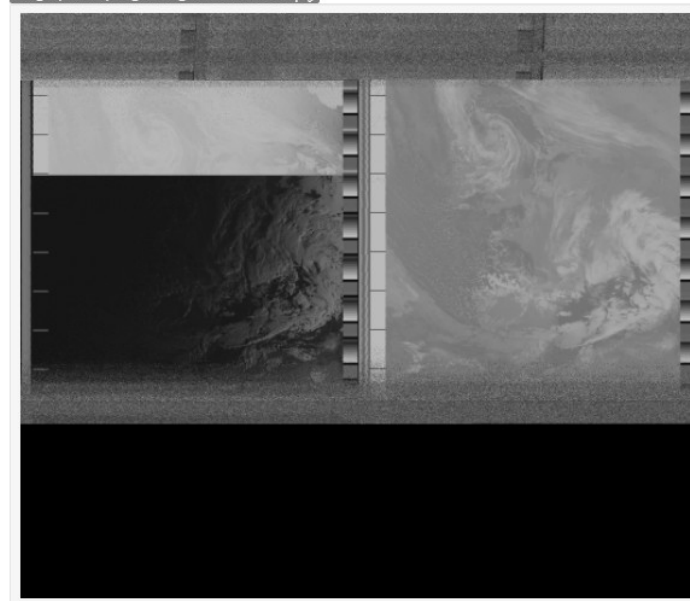
Downloads

Waterfall Audio Data 1

Discuss

ASCII HEX

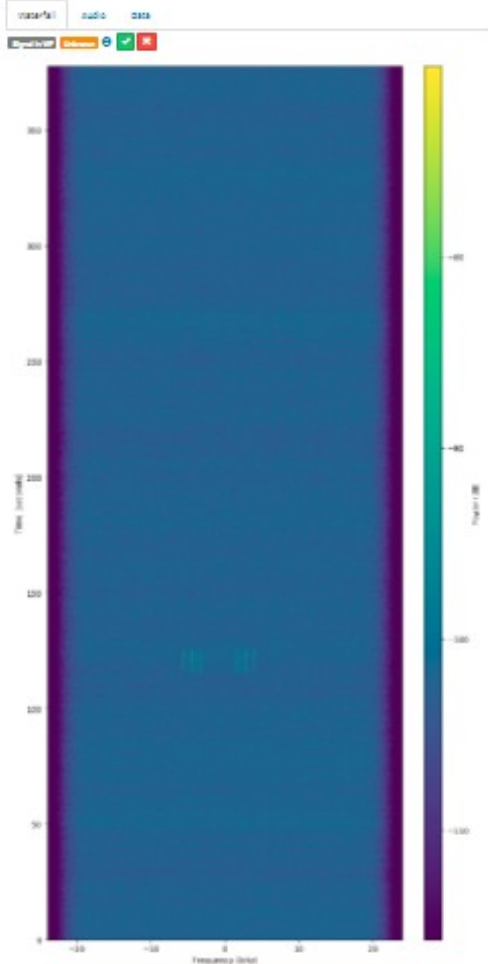
data_obs/3265093/data_3265093_2020-12-08T07-53-05.png



Observation #3234767

Timeframes are in UTC

- Satellite: 46287 - AmicalSat
- Station: 1797 - DL4EEC-SAT
- Observer: DL4EEC-SAT
- Status: Good
- Transmitter: Mode U - AFSK1k2 TLM
- Frequency: 436.100 MHz
- Drift: 2293 ppb
- Drifted Frequency: 436.101 MHz
- Mode: AFSK 1200
- Timeframe: 2020-12-05 20:40:07, 2020-12-05 20:33:33
- Rise: 120.0°
- Max: 26.0°
- Set: 112.0°
- Client Version: 1.4
- Metadata: [5 Items]
- Polar Plot:



- “Good” observation ?
 - Clear signal received
 - No data ...
- What we should have :

Observation #3242053

Timeframes are in UTC

- Satellite: 46287 - AmicalSat
- Station: 1797 - DL4EEC-SAT
- Observer: Alexander Barz
- Status: Good
- Transmitter: Mode U - AFSK1k2 TLM
- Frequency: 436.100 MHz
- Drift: 2293 ppb
- Drifted Frequency: 436.101 MHz
- Mode: AFSK 1200
- Timeframe: 2020-12-05 09:39:40, 2020-12-05 09:49:03
- Rise: 26.0°
- Max: 27.0°
- Set: 162.0°
- Client Version: 1.4
- Metadata: [5 Items]
- Polar Plot:
- Downloads: Audio Waterfall

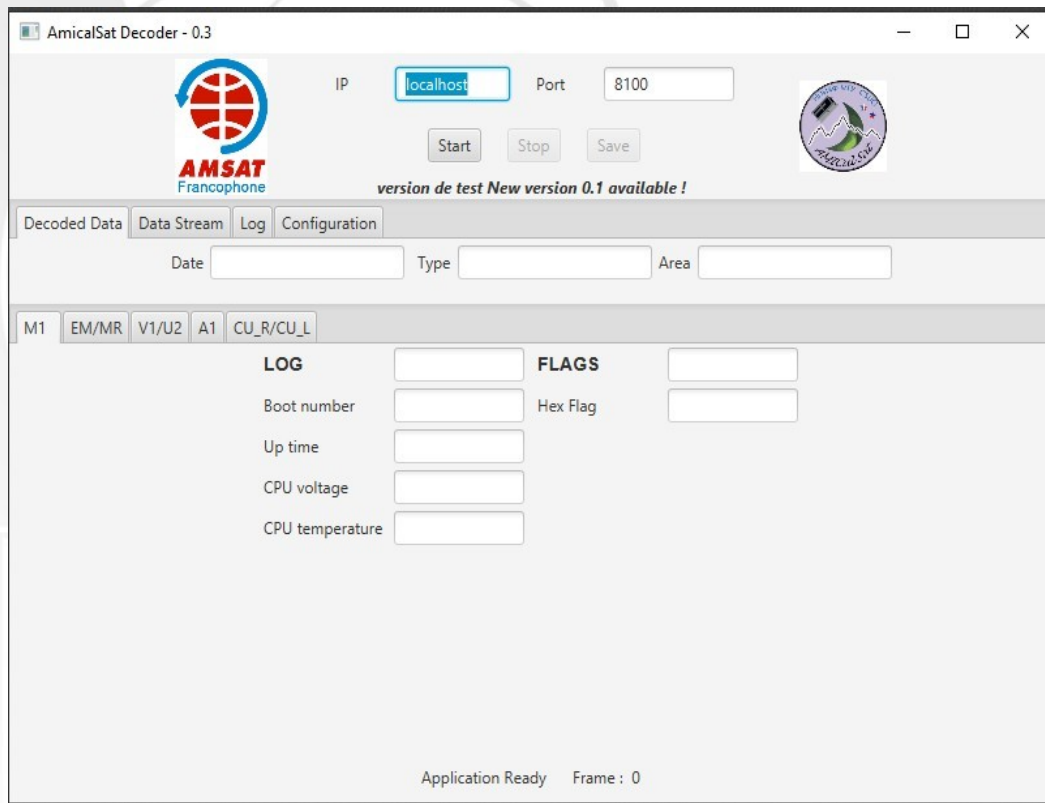
Waterfall Audio Data 27

```
data_obs/3242053/data_3242053_2020-12-05T09-39-47
82 A0 88 A6 A8 68 6C A4 A6 62 6E A6 40 6C AE 92 88 8A 62 40 62 AE 92 88 8A 64 40 63 03 F0
3D 40 31 38 4C 4F 47 3B 31 36 30 37 31 36 30 39 31 38 38 33 39 38 38 35 31 39 37 37 32 38
33 33 33 37 3B 2D 33
```

```
data_obs/3242053/data_3242053_2020-12-05T09-39-48
82 A0 88 A6 A8 68 6C A4 A6 62 6E A6 40 6C AE 92 88 8A 62 40 62 AE 92 88 8A 64 40 63 03 F0
3D 40 31 38 46 4C 41 47 53 3B 31 36 30 37 31 36 30 39 31 38 38 31 32 33 37 34 38 32 39 36 34 38 34
34 38 36 32 38 32 31 34 35 38 37 38 33 33 35 32
```

```
data_obs/3242053/data_3242053_2020-12-05T09-39-49
82 A0 88 A6 A8 68 6C A4 A6 62 6E A6 40 6C AE 92 88 8A 62 40 62 AE 92 88 8A 64 40 63 03 F0
3D 45 4D 3B 4D 4E 3B 31 36 30 37 31 36 30 39 31 38 38 31 31 32 35 32 38 32 39 37 39 38 33
39 38 37 30 38 36 33 31 38 37 38 33 33 35 32
```

```
data_obs/3242053/data_3242053_2020-12-05T09-39-50
82 A0 88 A6 A8 68 6C A4 A6 62 6E A6 40 6C AE 92 88 8A 62 40 62 AE 92 88 8A 64 40 63 03 F0
3D 45 4D 3B 4C 4F 47 3B 31 36 30 37 31 36 30 39 31 38 38 33 39 38 31 32 33 34 32 38 35 31
38 31 35 35 38 31 33 39 39 38 34 36 39 38
```



- + Modem :
- SoundModem
- DireWolf

But still, no demodulated data ...

ID	Satellite	Frequency	Mode	Timeframe	Results	Observer	Station
3260762	AmicalSat	436.100 MHz	AFSK 1200	2020-12-07 10:59:18 2020-12-07 11:07:04		cceres_team	1062 - CCERES Ground Station
3244310	AmicalSat	436.100 MHz	AFSK 1200	2020-12-04 22:11:54 2020-12-04 22:19:17		cceres_team	1062 - CCERES Ground Station
3244309	AmicalSat	436.100 MHz	AFSK 1200	2020-12-04 20:38:30 2020-12-04 20:44:15		cceres_team	1062 - CCERES Ground Station
3234770	AmicalSat	436.100 MHz	AFSK 1200	2020-12-04 11:25:24 2020-12-04 11:32:37		cceres_team	1062 - CCERES Ground Station
3234769	AmicalSat	436.100 MHz	AFSK 1200	2020-12-04 09:51:26 2020-12-04 09:57:24		cceres_team	1062 - CCERES Ground Station
3234768	AmicalSat	436.100 MHz	AFSK 1200	2020-12-03 22:20:44 2020-12-03 22:27:48		cceres_team	1062 - CCERES Ground Station
3234767	AmicalSat	436.100 MHz	AFSK 1200	2020-12-03 20:46:47 2020-12-03 20:53:05		cceres_team	1062 - CCERES Ground Station
3234766	AmicalSat	436.100 MHz	AFSK 1200	2020-12-02 22:29:36 2020-12-02 22:36:17		cceres_team	1062 - CCERES Ground Station
3234763	AmicalSat	436.100 MHz	AFSK 1200	2020-12-02 20:55:08 2020-12-02 21:01:52		cceres_team	1062 - CCERES Ground Station
3222413	AmicalSat	436.100 MHz	AFSK 1200	2020-12-02 10:08:19 2020-12-02 10:15:17		cceres_team	1062 - CCERES Ground Station
3222412	AmicalSat	436.100 MHz	AFSK 1200	2020-12-01 22:38:33 2020-12-01 22:44:43		cceres_team	1062 - CCERES Ground Station

AMICaISat Case :

- Try to configure the modem
- Contact the team for support
- Contact successful station owners

In general :

- Implement specific decoders directly into SatNOGS
- Create tutorials for 'new comers'
- Share our problem & give feedback

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louis.leleuch@obspm.fr