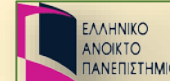


About the Hellenic radio telescope THERMO p Ylae

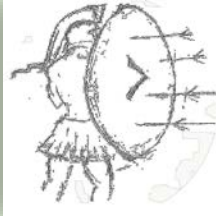
Redundant Telecom 32m Antenna



Nectaria A. B. Gizani & George P. Veldes



ETEPEP
LABoratory



Location Skarfia, Lokrida

Convert to 32m – RT Dish



Antenna
mechanic


Description

- elevation-over-azimuth wheel-and-track mount, MARK IV-B
- Antenna: Cassegrain, beam-waveguide
- drive system: Electric-servo, dual train for antibacklash
- C-band (T/R)
 - Transmission band ~6 GHz
 - Reception band ~4 GHz
 - Dual circularly polarized signals
- primary mirror: ~32 m
- Subreflector: ~2.9 m
- azimuth working range: -170° to +170°
- elevation range: 0° to 90°



Logos: THERMO p Ylae, ΕΤΕΠΕΡ, COSMOTE

Very well maintained equipment


Maintenance:

- Cleaning, lubrication and greasing mechanical parts
- Electricity
- security

Telecommunication Company
COSMOTE



THERMO p Ylae

Surface accuracy:	48 km/hr wind gusting to 72 km/hr (3 ₋₅) /D 4 x 10 ⁻⁵
	72 km/hr wind gusting to 96 km/hr (3 ₋₅) /D 6 x 10 ⁻⁵
Total weight on EL axis:	121 tons
Total weight on track:	243 tons
Track diameter:	16.97 m
EL bull gear pitch circle diameter:	12.992 m

Wind speed in operation:
Hold in any position:
Survive in stow position:

Winds up to 128 km/hr
Winds up to 115 km/hr
Winds up to 192 km/hr

Tracking velocity:
Slew velocity:
Max. acceleration and deceleration (both axes):

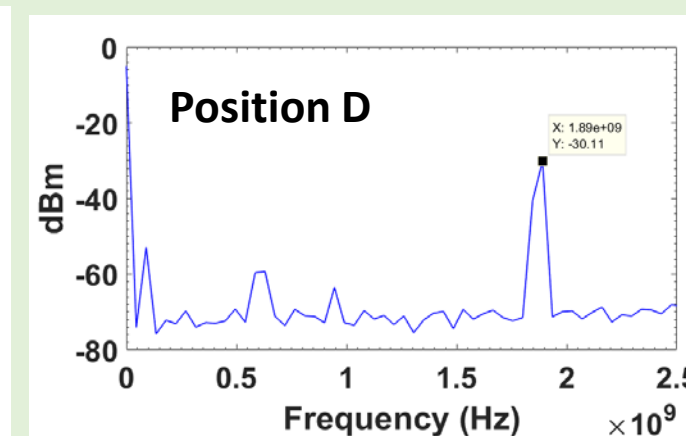
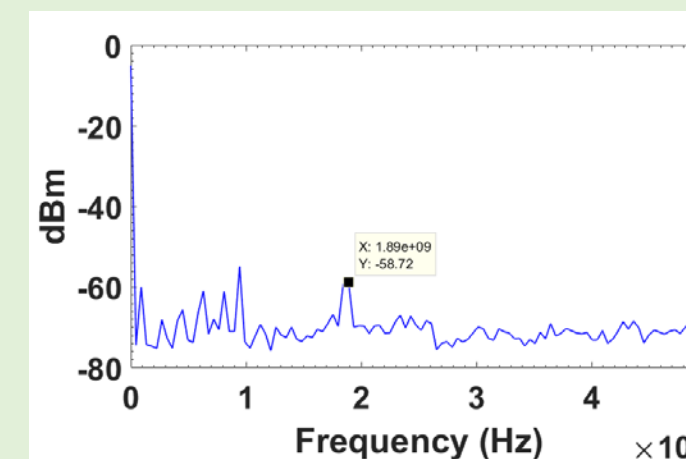
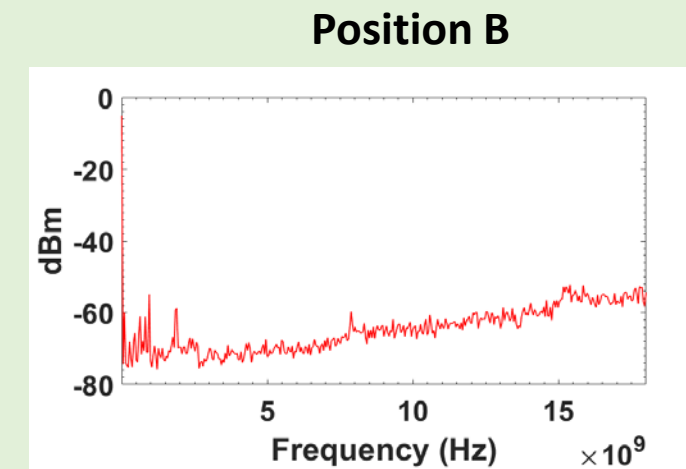
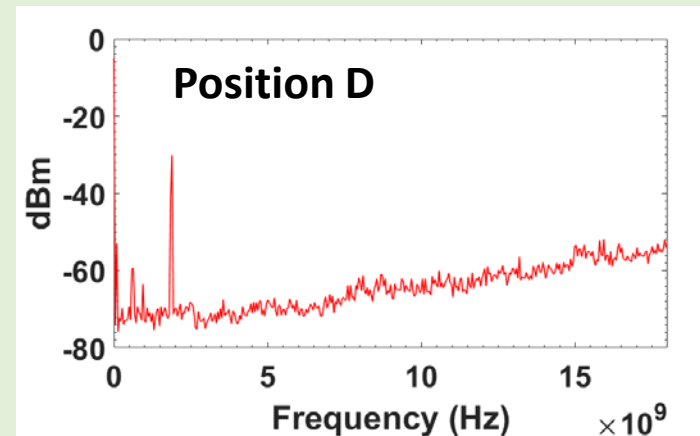
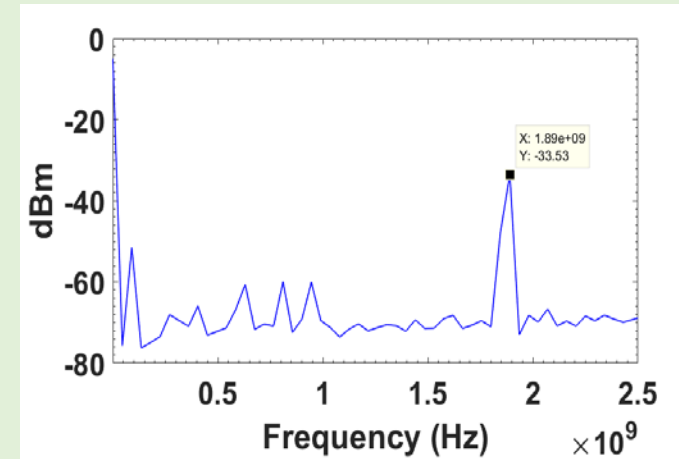
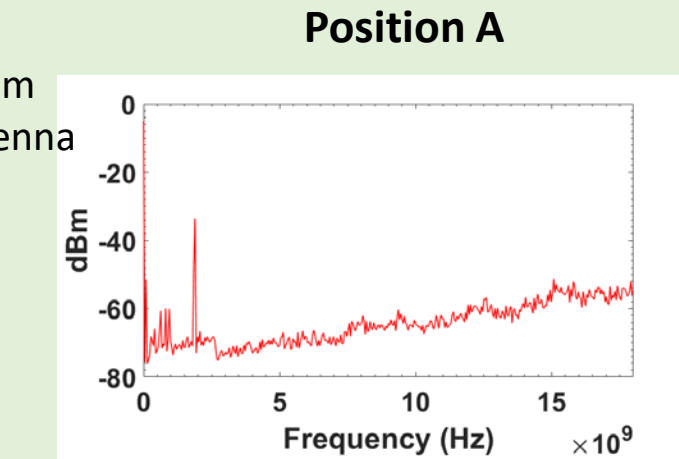
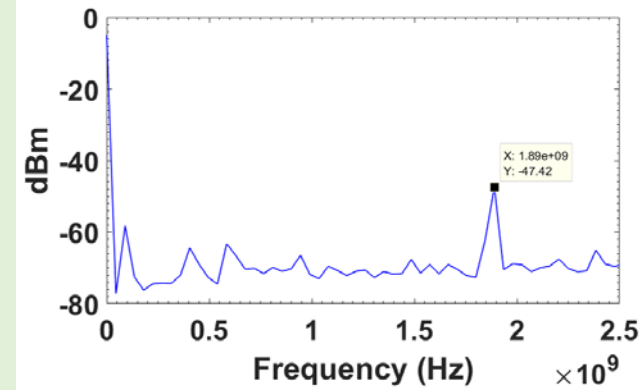
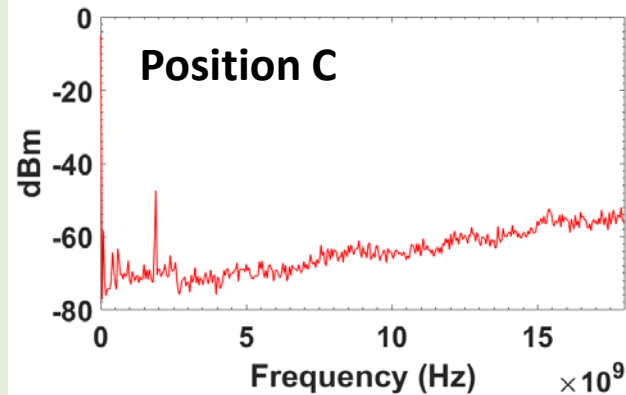
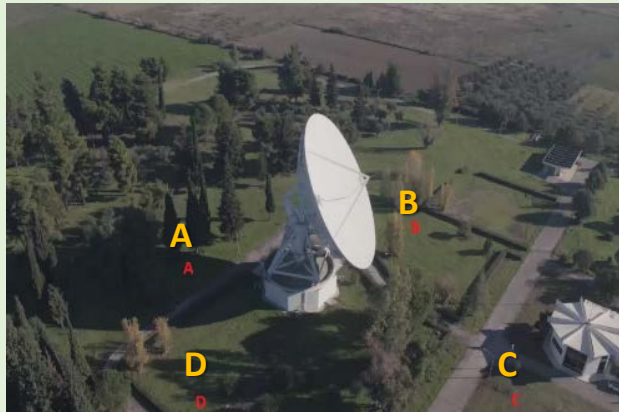
Up to 0.3°/second in both axes
Up to 0.3°/second in both axes
0.2°/second² in both axes

Performance



Some preliminary RFI

May 2019, @ 0-18 GHz (portable spectrum analyzer N9917A w omni-directional antenna)



* Recorded signal in L-band at ~ 1.9 GHz : Very close to mobile telecoms frequency band

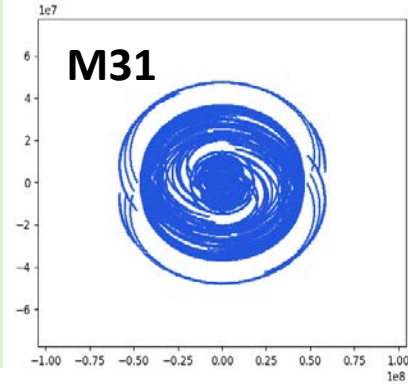
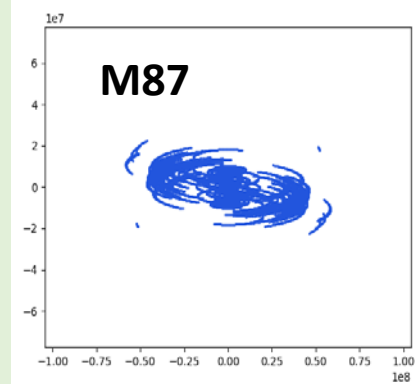
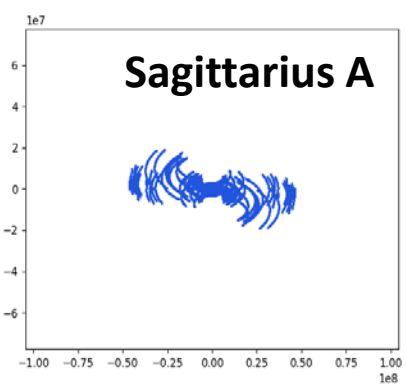
* Waterfall diagrams show stability over t

* During antenna motion (early Nov 2019) detected RFI of unknown origin independent of dish direction, increased towards SW.

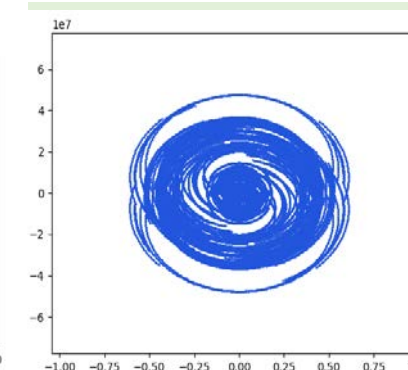
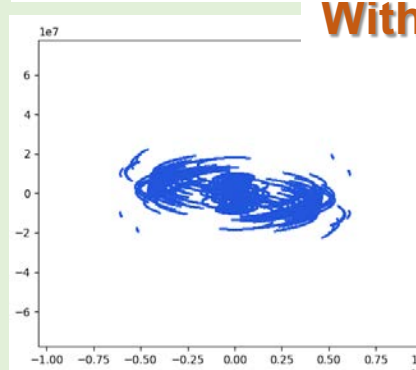
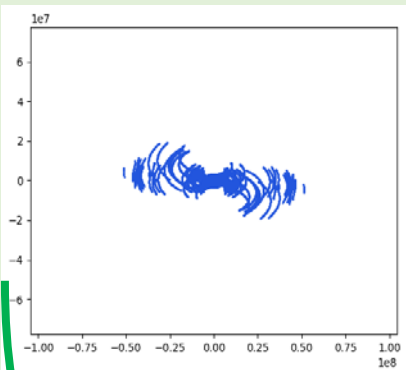
UV – plots

1.67 GHz

Without THERMOpYlae



With



Hellenic antenna:

- fill in inner region → "large scale structure".
- provides some of largest baselines → higher angular resoln

Need to perform detailed RFI monitoring measurements with a directional antenna to also capture any transient RFI.

OBTAINED ~ 2M € from National Funds since Spring 2020, for conversion

Still waiting for the Hellenic Open University to release publicly the Invitation to Tender for the already specified required equipment for the conversion

Future Plans

In Operation

- Stand-alone single dish observations
(Total Intensity & Polarization, continuum + spectral line mode)
- operate the antenna at L-band, 23'.6 resoln ??
- need detailed RFI monitoring
- Linked in the Very Long Baseline Interferometry
(Total Intensity & Polarization, continuum + spectral line mode, eg. EVN, VLBI)
→ increase sensitivity of interferometer

Other Functionalities - Innovative technology - **metamaterials**

- Deep space telecommunications

- SETI searches – commensal and dedicated ::
Breakthrough Listen Project - backend

