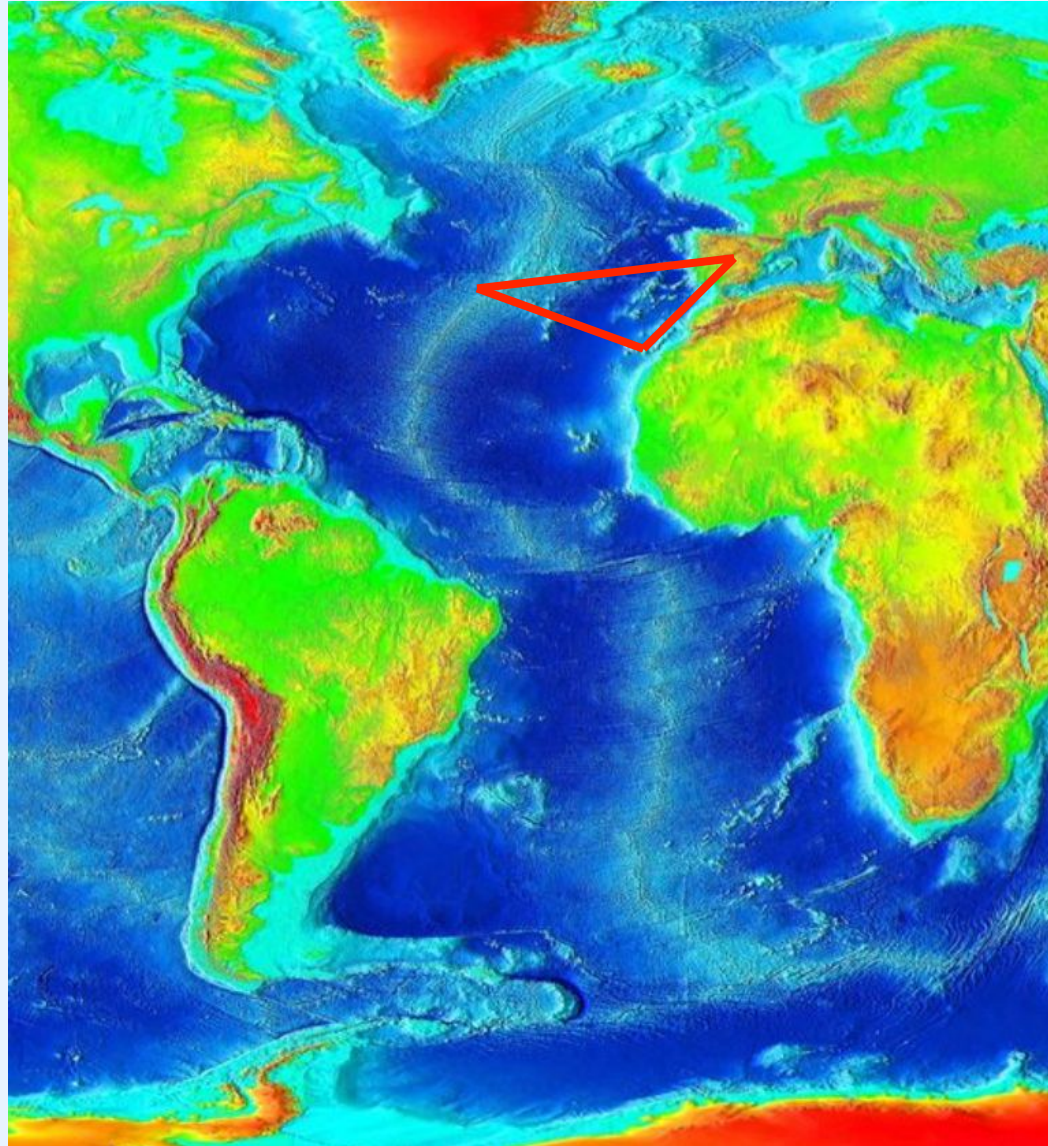


# STATUS OF THE SPANISH/PORTUGUESE RAEGE PROJECT



GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE FOMENTO



Jesús Gómez-González<sup>1</sup>

Luis R. Santos<sup>2</sup>

José Antonio López-Fernández<sup>1</sup>

Francisco Colomer<sup>1</sup>

<sup>1</sup> IGN, Spain & <sup>2</sup> DRCT, Portugal

*on behalf of the staff of RAEGE  
(Yebe and Santa María)*

<http://www.raege.net/>



## The RAEGE project

Establishment of an Spanish-Portuguese **Network of Geodynamical and Space Stations** (*RAEGE*) by the installation and operation of **four fundamental geodetic stations** provided with radio telescopes with VGOS specifications in Yebes (1), Canary Islands (1) and Azores Islands (2).



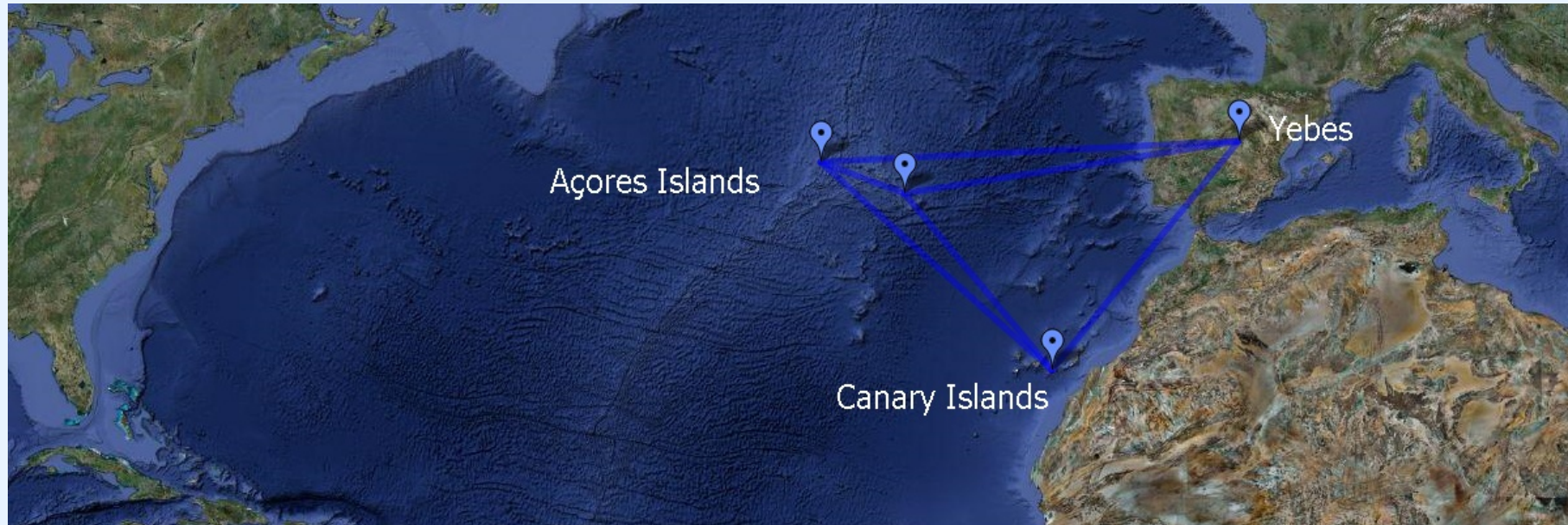


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## Baselines:

- Yebes – Tenerife : 1800 km
- Yebes – Santa María : 2000 km
- Yebes – Flores : 2400 km
- Tenerife – Flores : 2000 km
- Santa María – Flores : 540 km



## Initial equipment to be installed at each RAEGE station

- Geodetic VLBI 2010 radio telescope:
  - Diameter  $\geq 13$  m, freq  $\geq 45$  GHz
- Gravimeter.
- Permanent GNSS station.
- Satellite Laser Ranging (Yebes, other?).





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## RAEGE station in Yebes (Guadalajara, Spain)





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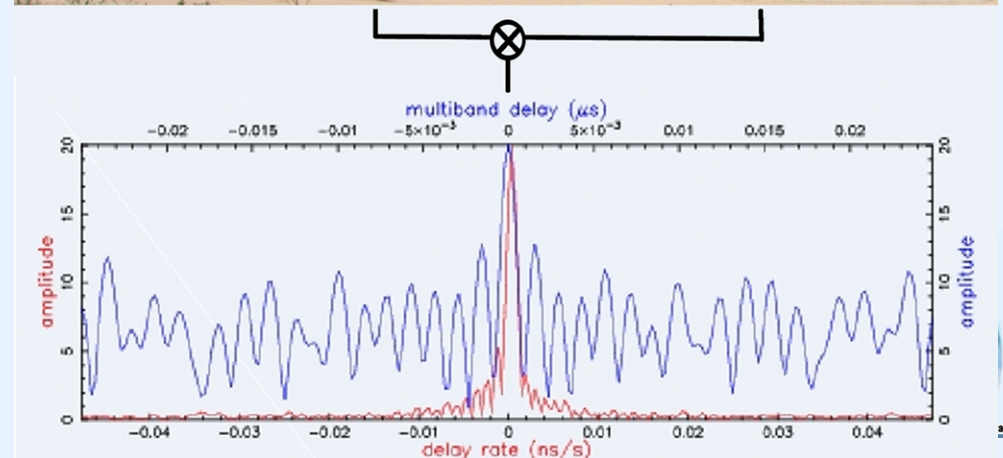
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## RAEGE 13.2m radio telescope in Yebes Observatory

“Jorge Juan”

(see talks by José Antonio  
López-Fernández et al.; and  
Pablo de Vicente et al.)



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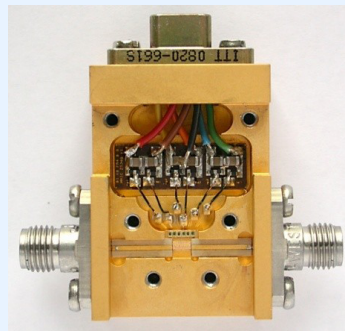
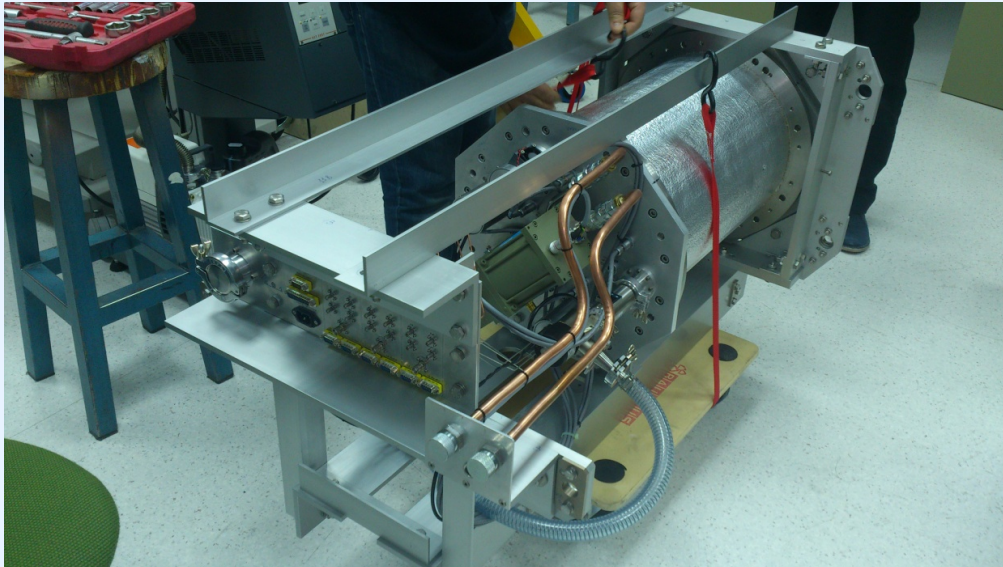


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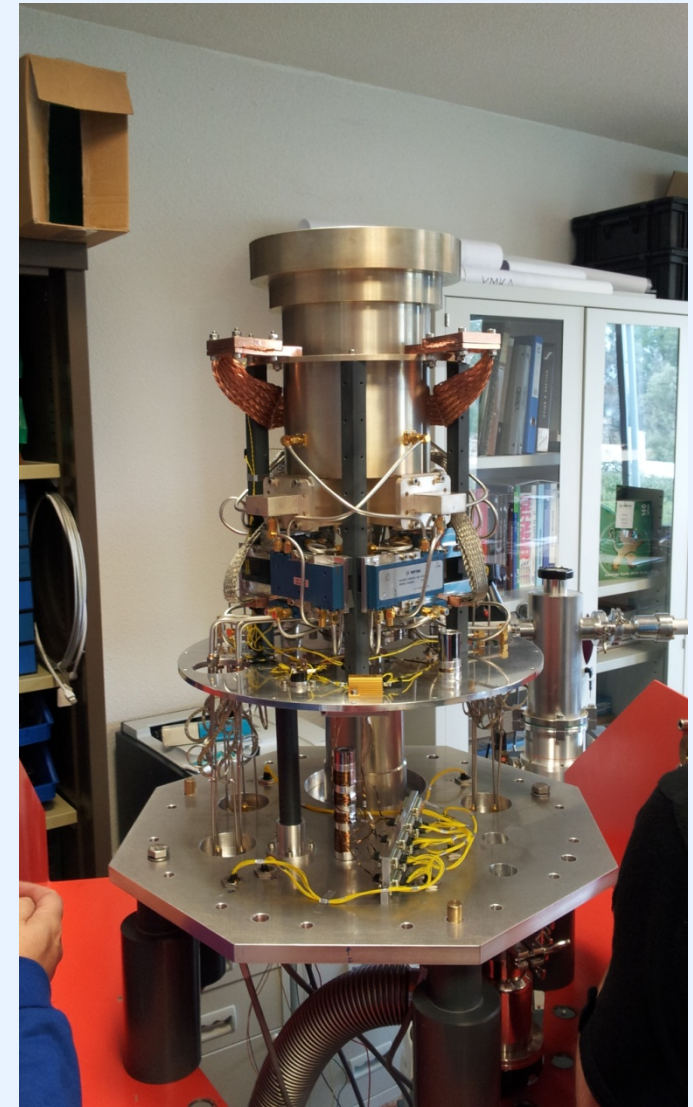
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## Tri-Band Receiver (S/X/Ka)



(see talk by López-Fernández et al.)





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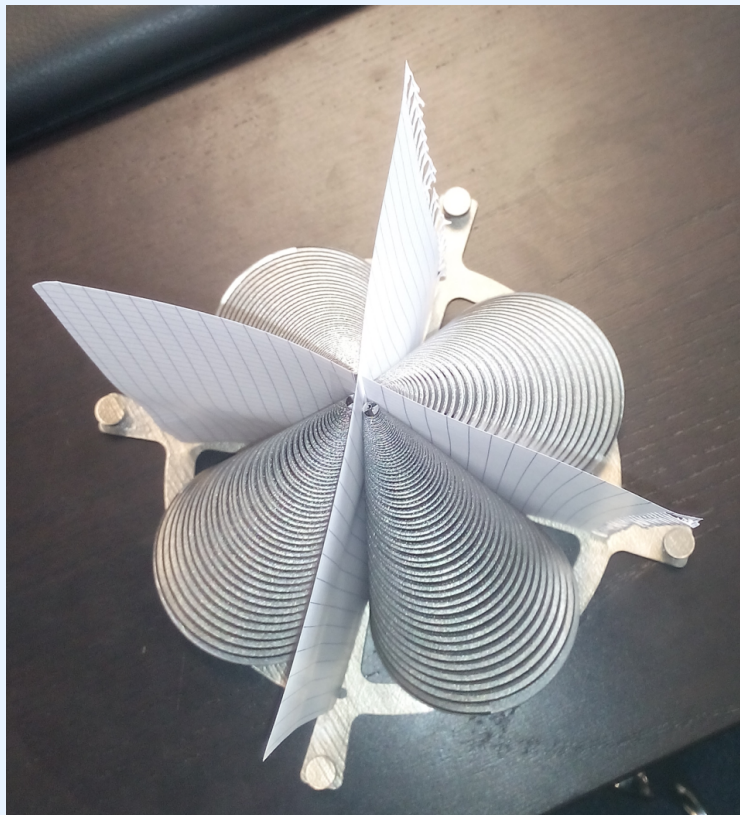
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## Broadband receiver (2-14 GHz) for VGOS



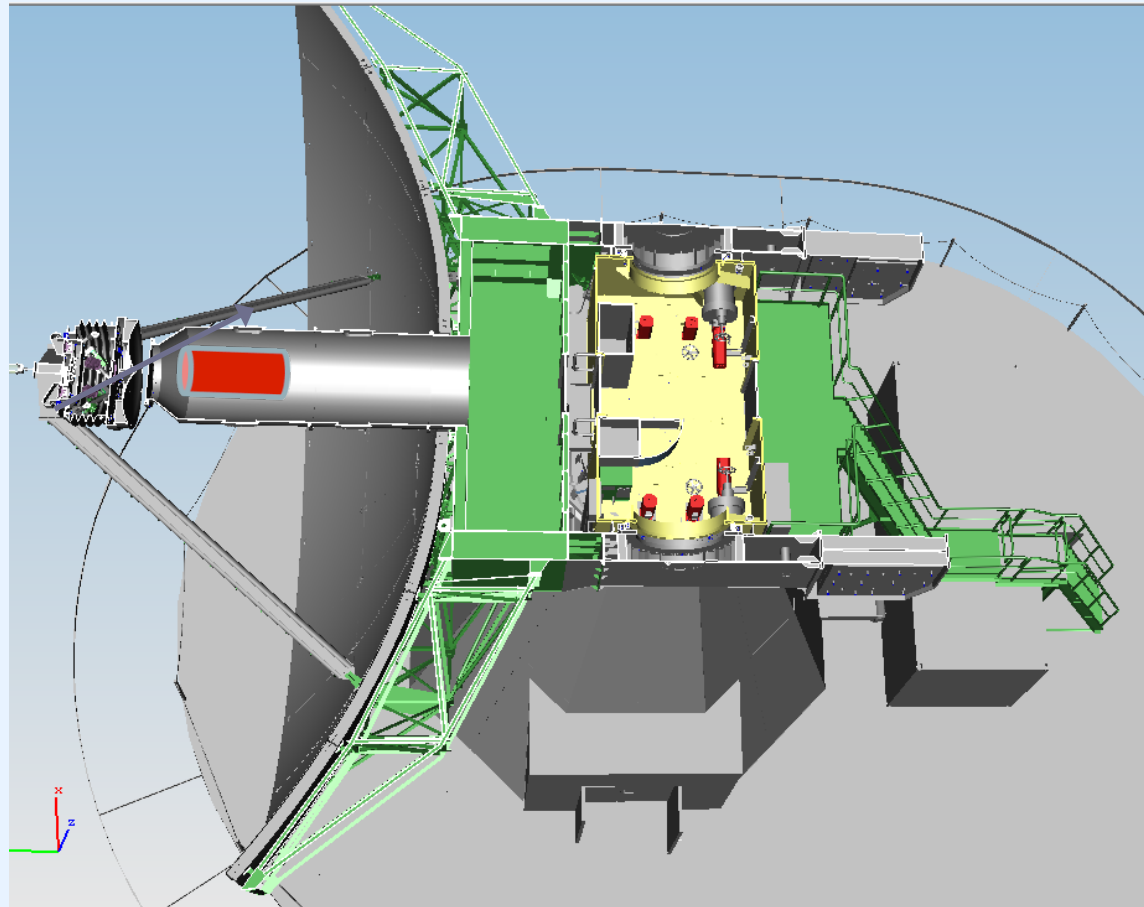
(see talk by López-Fernández et al.)







## Receiver Installation



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## Gravimeter building and equipment at Yebees:



- Seven pillars for instrument comparison
- Two absolute gravimeters (A10 & FG5)
- Superconducting gravimeter (GWR)





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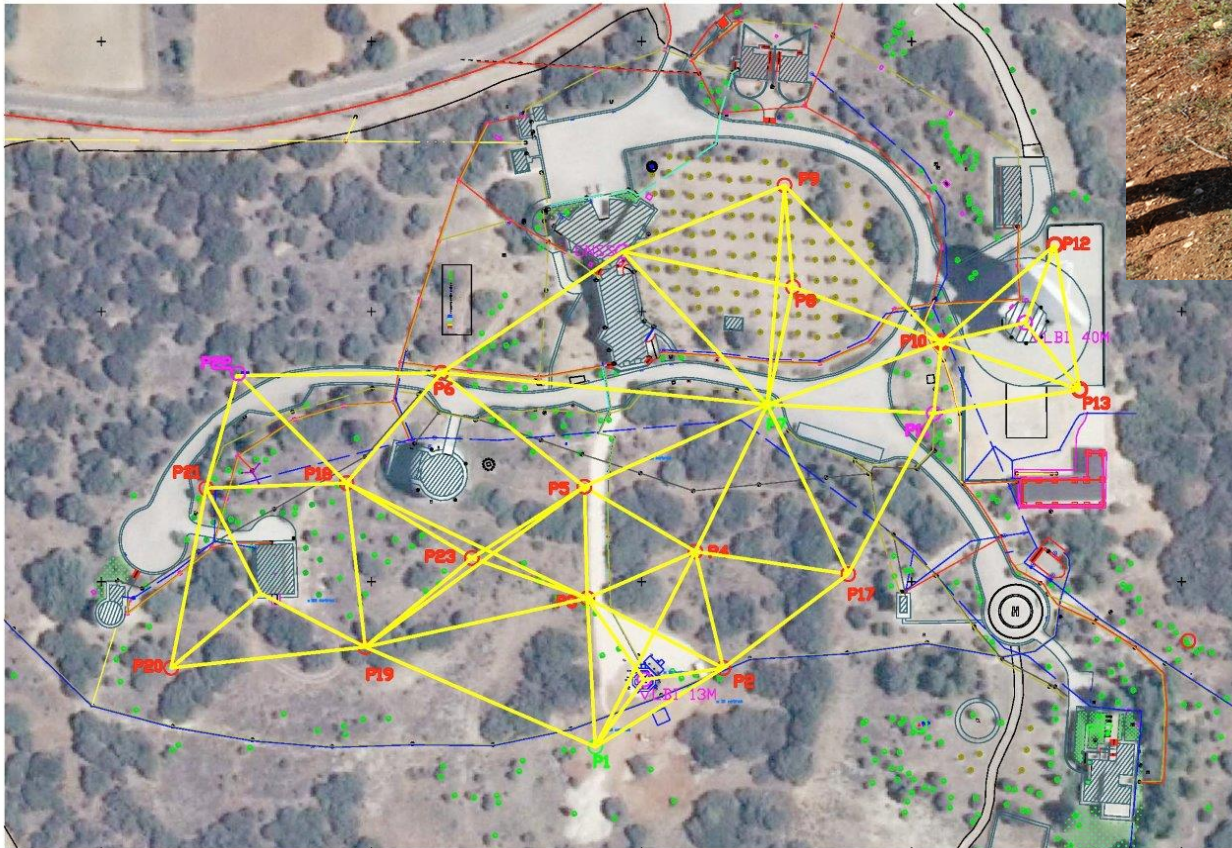
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## Local tie

(see poster by Córdoba et al.)





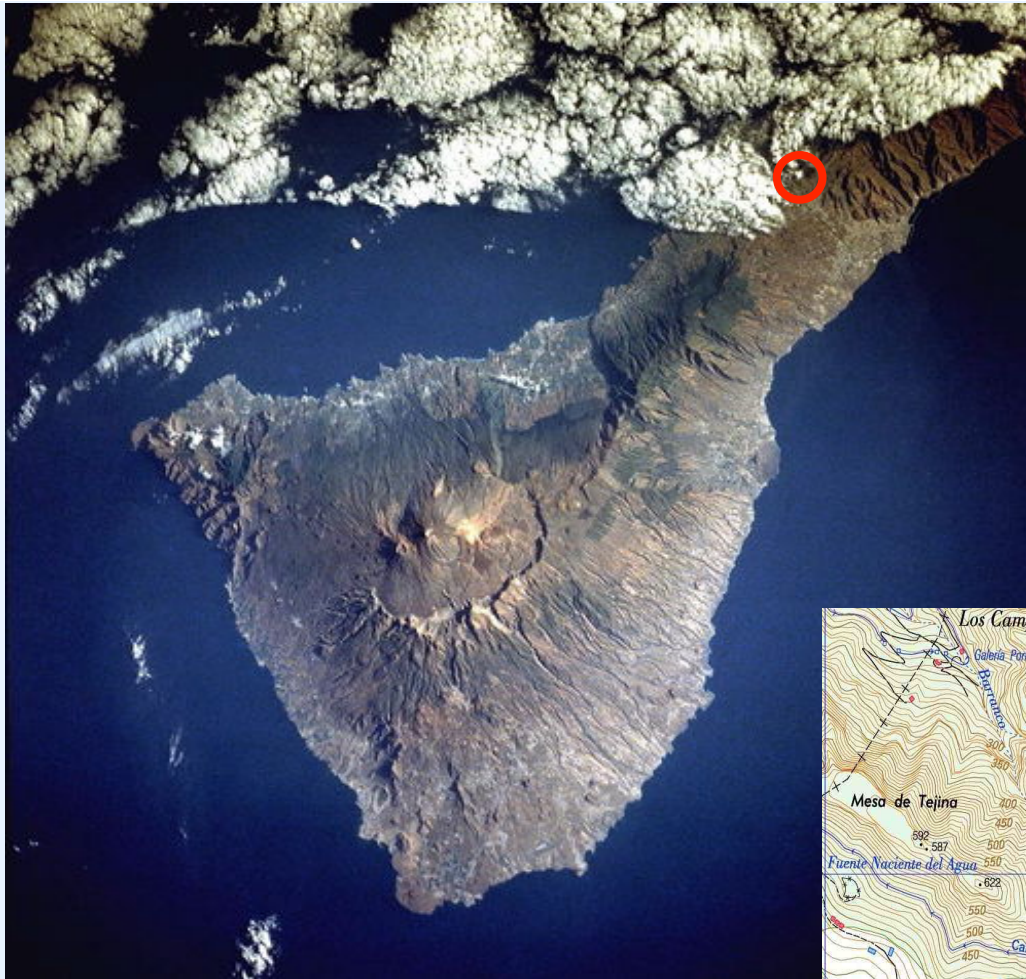
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## RAEGE station in Canary Islands (Spain)

To be equipped with:

- one radiotelescope
- one GNSS receiver
- one gravimeter

Possible location:

Tegueste (Tenerife)





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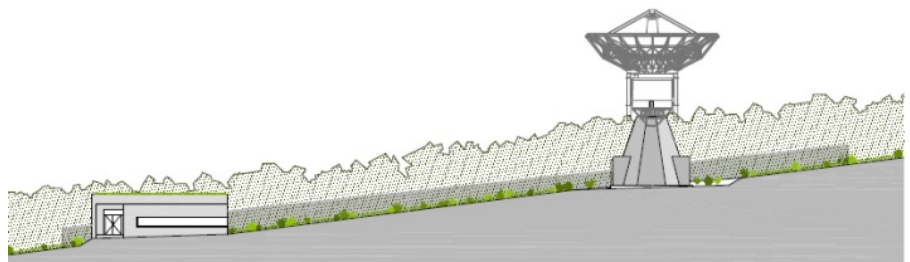
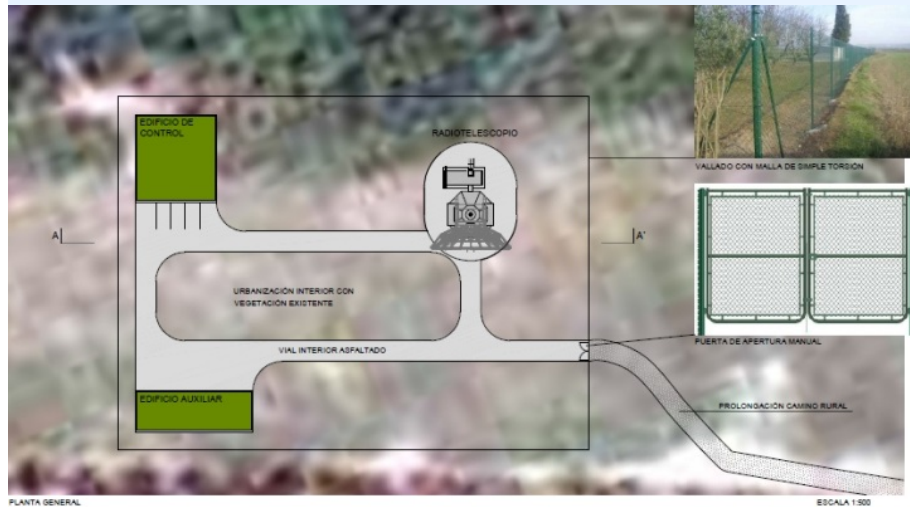
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## Tegueste (Tenerife island)



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## RAEGE stations in Azores (Portugal)





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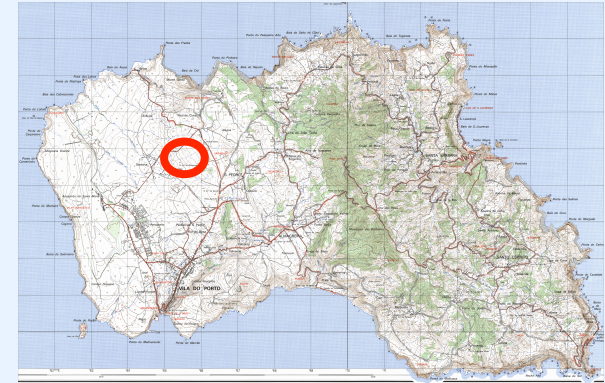
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## **Santa Maria: Saramago** **RAEGE station "COLUMBUS"**



***Inauguration on May 20 !***



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## RAEGE station in Santa Maria





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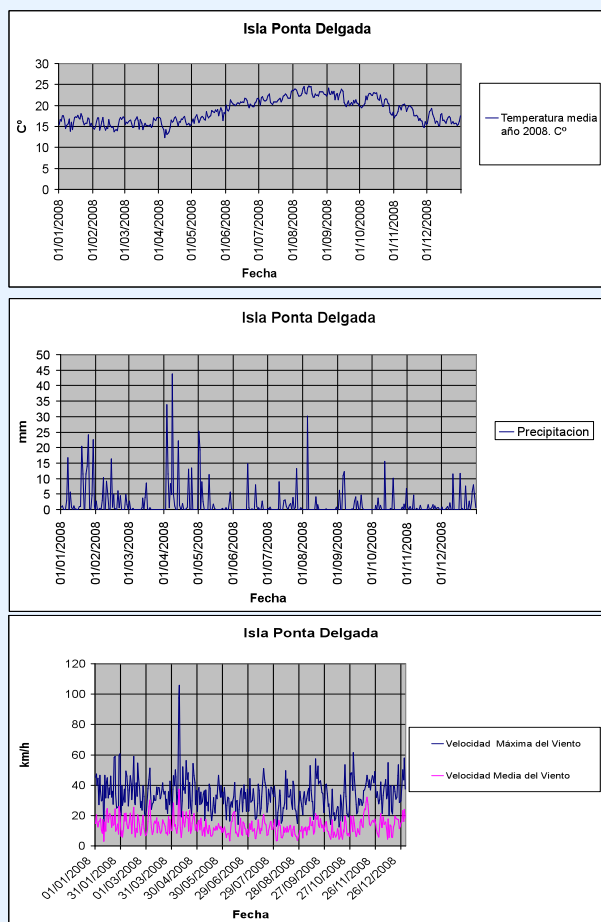
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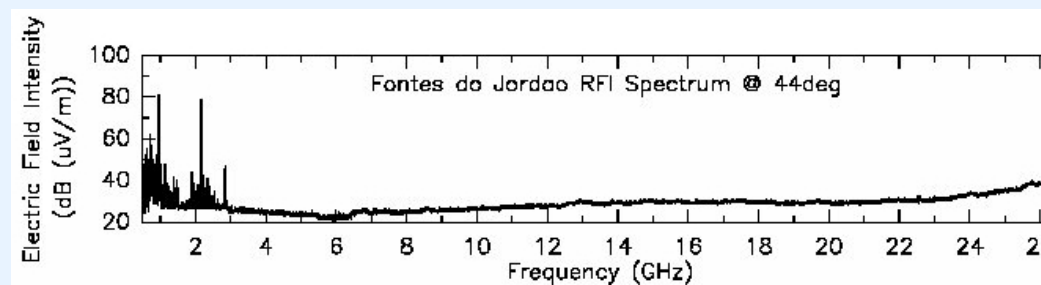


## Meteorology and RFI

### Temperature / Rain / Wind (San Miguel)



### RFI measurements (1–26 GHz) (Santa María)





# STATUS OF THE SPANISH/PORTUGUESE RAEGE PROJECT



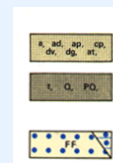
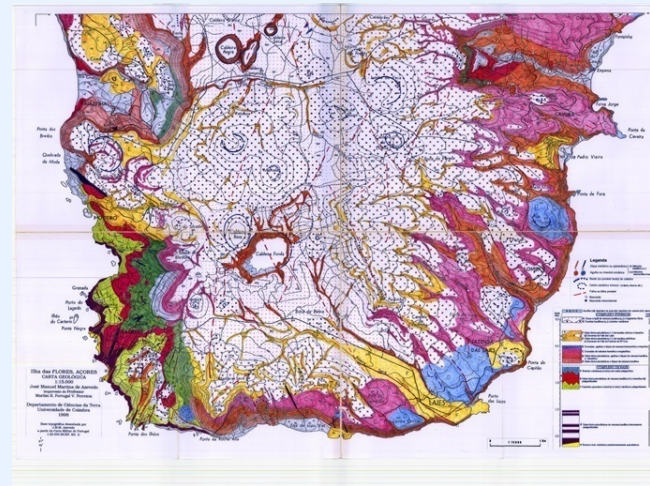
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## Flores: Lajes



Aluvión  
Conglomerado  
Basaltos



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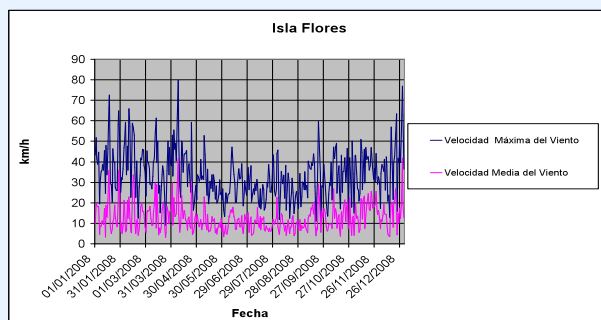
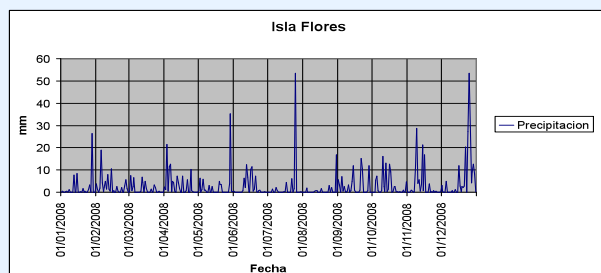
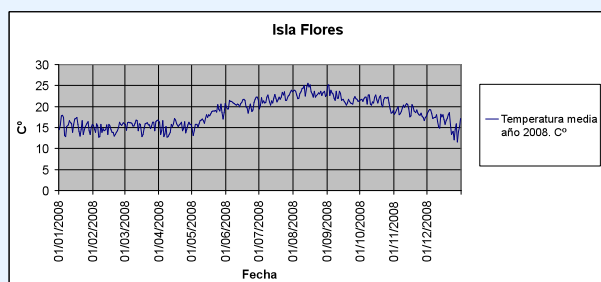
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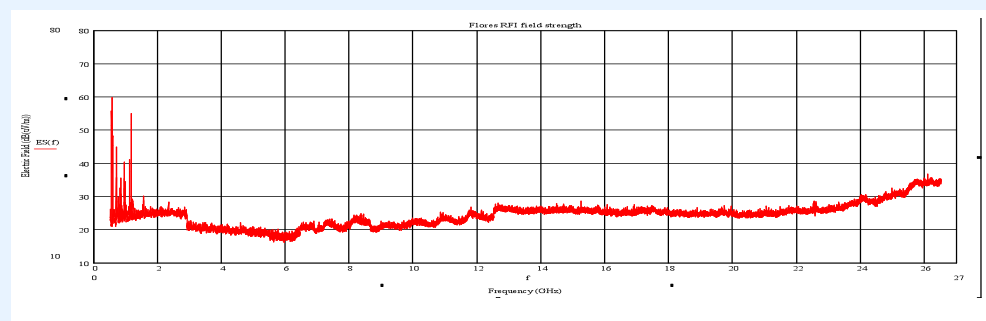


## Meteorology and RFI

### Temperature / Rain / Wind



### RFI measurements (1–26 GHz)





## Final comments

- The first two RAEGE antennas have been constructed (Yebe in 2013, Santa María in 2014).
- Site in Tenerife is selected (Tegueste/La Orilla), the geological studies are ready, and the antenna erection is planned in 2016
- Developed VGOS related instrumentation (feeds, receivers for S/X/Ka bands; broadband ongoing), local tie, etc.

