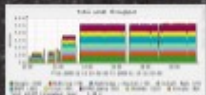
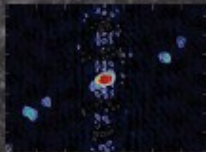
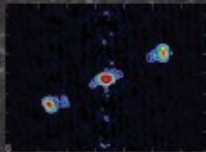


Science and Technology of Long Baseline Real-Time Interferometry: The 8th International e-VLBI Workshop <http://www.oan.es/expres09/>

22-26 June 2009
Madrid, Spain



The above images of 2245 Herbig-Haro are the result of a series of observations made with the VLBI in November 2008. The images show the structure of the jet and the expansion of the jet. The images are taken at different frequencies, showing the structure of the jet at different wavelengths.

The above background image is a mosaic of images taken with the VLBI in November 2008. The images show the structure of the jet and the expansion of the jet. The images are taken at different frequencies, showing the structure of the jet at different wavelengths.

In recent years real-time, long-baseline, radio interferometry over optical networks has developed from a technical possibility to a mature technique. The time is ripe to bring together all those working on the science and technology of e-VLBI to discuss the state-of-the-art and future prospects.

This week long conference will cover both scientific applications (first half) and technical implementation (second half) with joint sessions in the middle. Participants are welcome to attend a part or the whole of the conference. The conference proceedings will be published electronically. Specific areas to be covered include:

- **Scientific:** Applications of real-time operation to astronomy, geodesy and other fields. How to best coordinate emerging e-VLBI arrays for best scientific return. Connections to transient monitoring in other wavebands including Fermi Gamma-Ray Space Telescope observations.
- **Technical:** e-VLBI test experiments, use of new long distance links, development of techniques including selective packet dropping and novel protocols, search for higher bandwidths, network status and monitoring, distributed processing, and future development.
- **Scientific/Technical:** Technical possibilities of interest in planning future instruments. Desired technical requirements to fulfill scientific goals, science priorities for development.

Scientific Organizing Committee

- Chair: John Kovary, Onsala Space Observatory (Sweden)
- Chair: Ralph Spanner, Jet Propulsion Laboratory (JPL)
- Bob Fender, Southampton University (UK)
- Mike Garver, ARIZONA (The Netherlands)
- Alexander J. van der Meer, RAS/IRAF/CNRS (USA)
- Ralf Kijak, Onsala Space Observatory (Sweden)
- Richard Hughes-Fries, JPL/STC (USA)
- Hubert van der Lugt, Eindhoven University of Technology (The Netherlands)
- James Miller-Jones, NRAO (USA)
- David Perley, JIVE (The Netherlands)
- Miguel Ángel Pérez-Torres, IIA-CSIC (Spain)
- Chris Phillips, CSIRO (Australia)
- Mitsuru Sekita, KIRIYUKI (Japan)
- Arpad Szekeres, JIVE (The Netherlands)
- Steven Tague, Curtin University of Technology (Australia)
- David Tatarski, CSIRO (Australia)
- Pablo de Vicente, OAN (Spain)
- Alan Whitney, Haystack Observatory, MIT (USA)

Local Organizing Committee

- Chair: Francisco Gómez, IGN-IGN (Spain)
- Juan Francisco Gómez, OAN (Spain)
- Yoonas Kari, JIVE (The Netherlands)
- Rafaela Soria, OAN (Spain)
- E. Charles Tan, JIVE (The Netherlands)

EXPreS Sci+Tech Workshop

June 22-26 2009
Madrid, Spain

<http://www.oan.es/expres09/>

April 15th: Registration deadline
April 21st: Hotel booking deadline
May 1st: Abstract deadline

This workshop is sponsored by the Centro Nacional de Información Geográfica - Instituto Geográfico Nacional (IGN-IGN) of Spain and EXPreS. EXPreS is an Integrated Infrastructure Initiative (I²), funded under the European Commission's Sixth Framework Programme (FP6), contract number 026942.

EXPreS

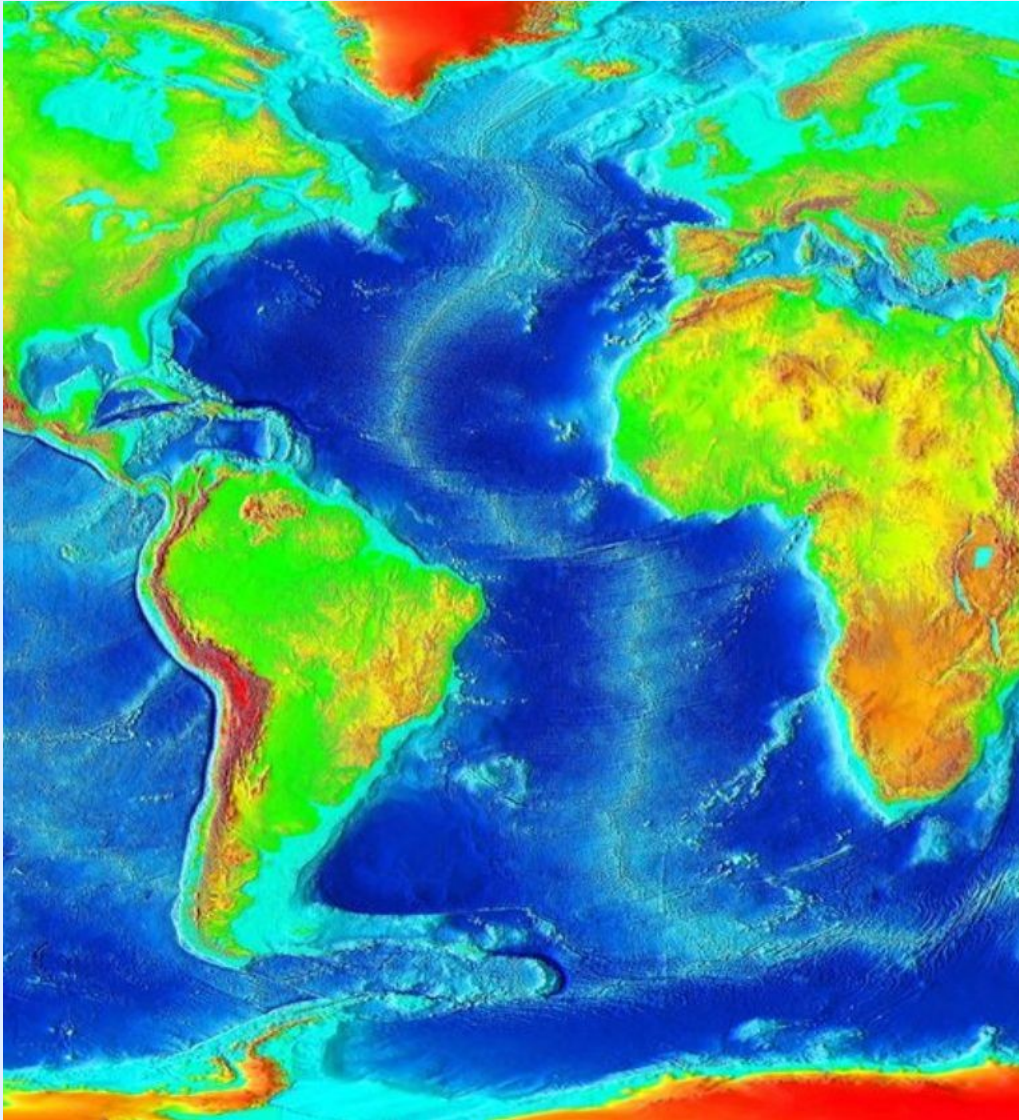


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NACIONAL





Jesús Gómez-González

Francisco Colomer

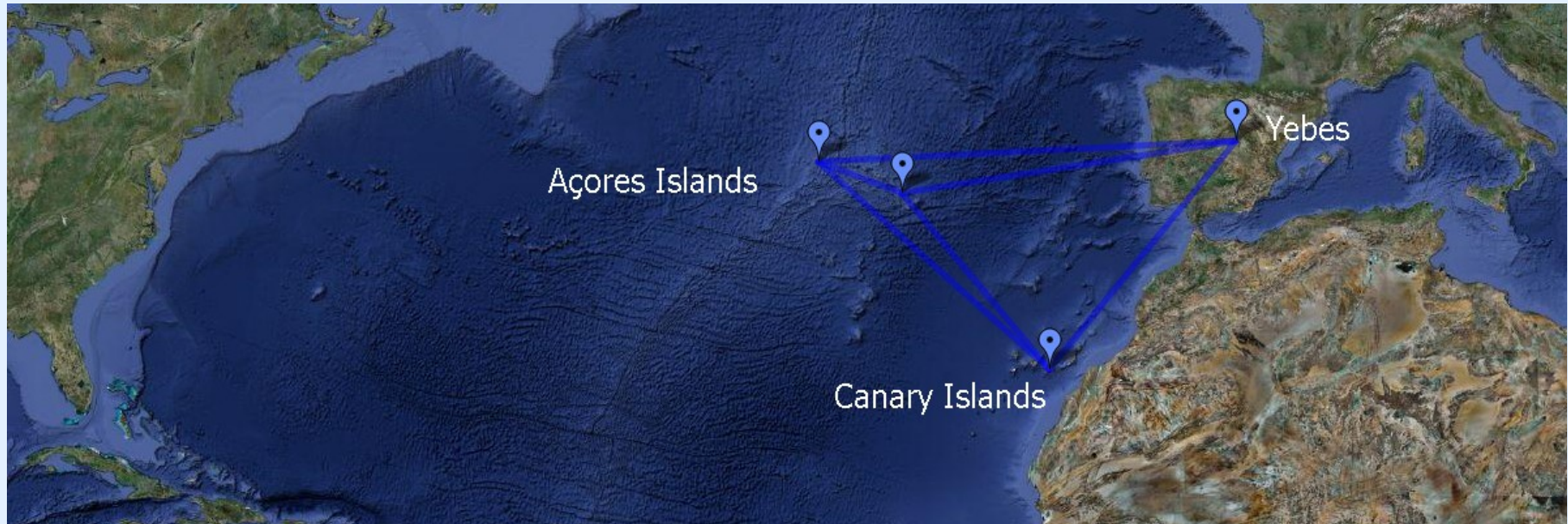
Instituto Geográfico Nacional
Spain



1. The RAEGE project

Establishment of an Spanish-Portuguese **Network of Geodynamical and Space Geodesy Stations** (*RAEGE*) by the installation and operation of **four fundamental geodetic/astronomical stations** provided with radiotelescopes fulfilling the VLBI 2010 project specifications: Yebes (1), Canary Islands (1) and Açores Islands (2).





Baselines:

- Yebes – Canary Islands : 1800 km
- Yebes – Sao Miguel : 2000 km
- Yebes – Flores : 2400 km
- Canary Islands – Flores : 2000 km
- Sao Miguel – Flores : 540 km





Baselines:

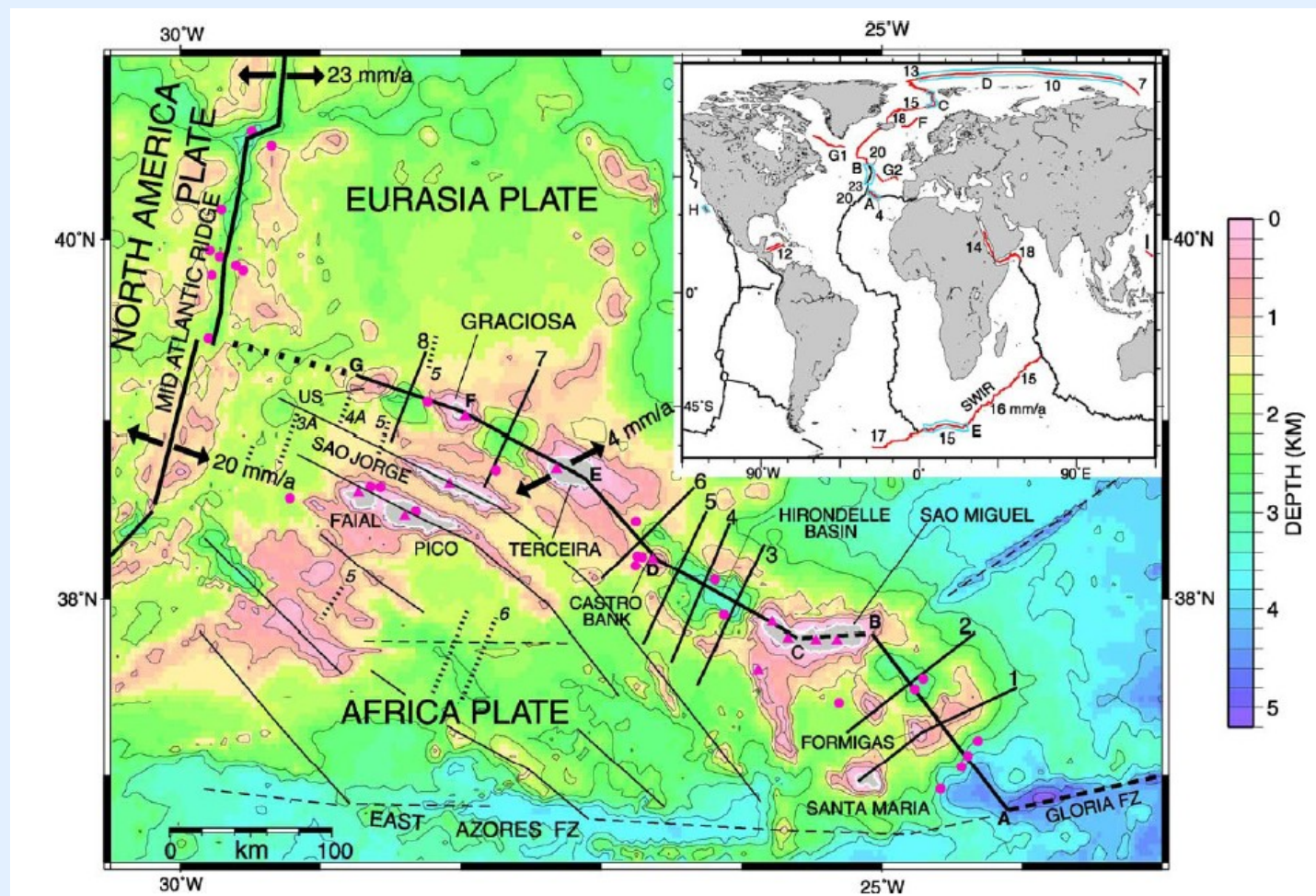
- Yebes – Flores : 2400 km
- Gran Canaria – Flores : 2000 km
- Sao Miguel – Flores : 540 km





Açores Islands, Portugal



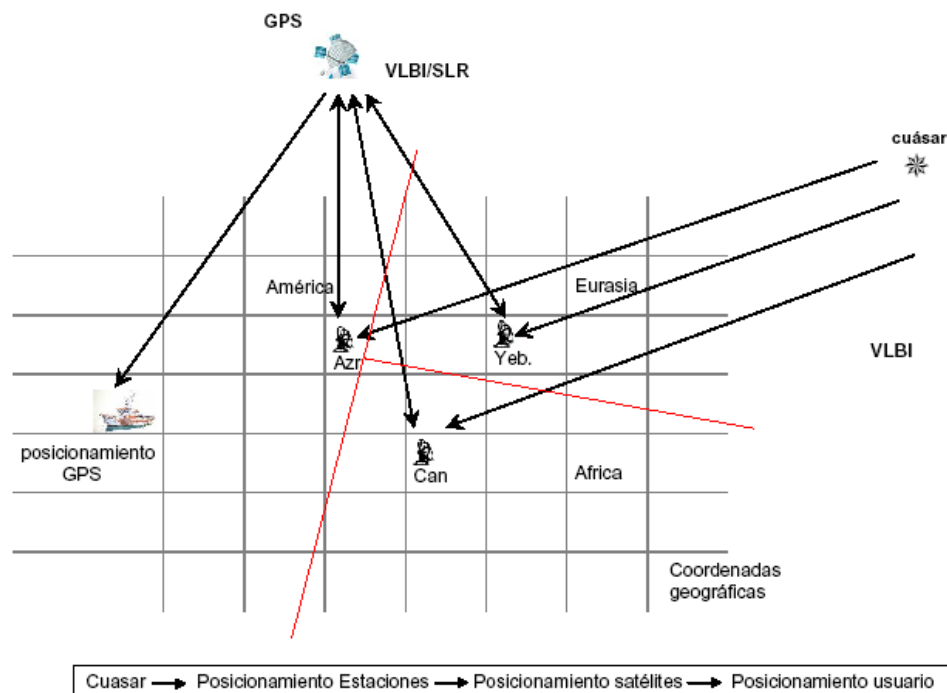




Canary Islands, Spain



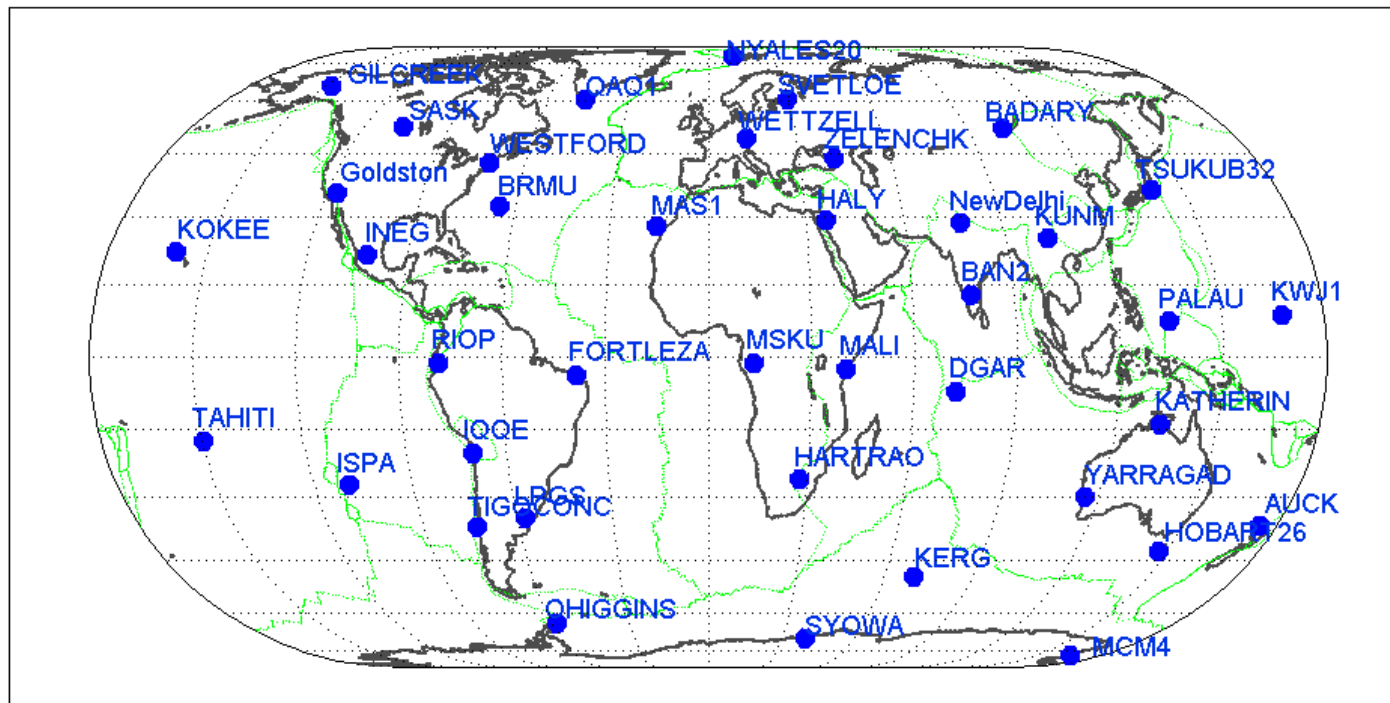
2. Scientific and technical fundamentals: the VLBI2010 project



Products	Specification	Status 2002	Goals (VLBI2010)
Polar Motion (x_p , y_p)	accuracy product delivery resolution frequency of solution	$x_p \sim 100$, $y_p \sim 200 \mu\text{s}$ 1 – 4 weeks – 4 months 1 day 3 days/week	25 μs 1 day 10 min – 1 h 7 days/week
UT1-UTC (DUT1)	accuracy product delivery resolution	5 – 20 μs 1 week 1 day	2 μs 1 day 10 min
Celestial Pole ($d\epsilon$; $d\psi$)	accuracy product delivery resolution frequency of solution	100 – 400 μs 1 – 4 weeks – 4 months 1 day ~ 3 days/week	25 μs 1 day 7 days/week
TRF (x , y , z)	accuracy	5 – 20 mm	2 mm
CRF (α ; δ)	accuracy frequency of solution product delivery	0.25 – 3 mas 1 year 3 – 6 months	0.25 mas improve. for more freq. bands 1 month



simulation - 40 stns origin(lon,lat) [0 0]



3. Initial equipment to be installed at each station

- Geodetic VLBI 2010 radiotelescope:
 - Diameter $\geq 12\text{m}$, freq $\geq 40\text{GHz}$
 - Most could be built in Spain.
- Superconducting gravimeter.
- Permanent GNSS station.
- Satellite Laser Ranging (Yebes).





VLBI2010 radiotelescope

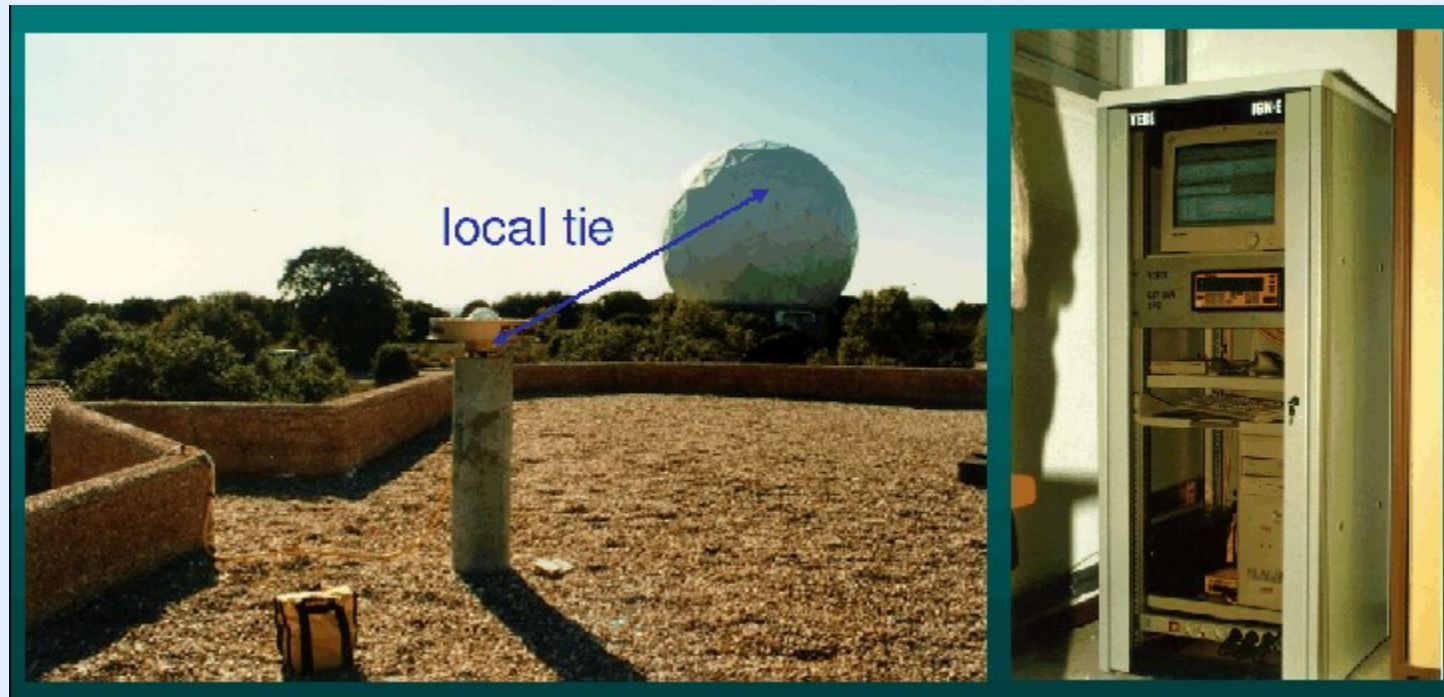


Proposed design of TTW by
Vertex Antennentechnik GmbH

TTW:

- Main reflector: 13.2m
- ALMA mount
- Optics: ring focus, Axially displaced ellipse reflector
- $f/D = \sim 0.29$
- Subreflector with hexapod mount
- Vel.: Az $12^\circ/\text{s}$, El $6^\circ/\text{s}$
- Acc.: Az/El $3^\circ/\text{s}^2$
- 27 bit Encoder: 0.3m°





Permanent IGS station “YEBE”





Gravimeter building and equipment at Yebes:

- Seven pillars for instrument comparison
- Two gravimeters (A10 & FG5)
- Purchasing the first superconducting gravimeter (2010)



4. IGN capabilities

- Long time experience in technical aspects of VLBI (radiotelescopes, front-ends and back-ends).
- Participation in the VLBI networks and organizations (IVS, EVN).
- Infrastructures and equipment for the main station (Yebes).
- IGN geodetic/geophysical centre at Canary Islands.
- Collaboration agreement between IGN and the Açores Regional Government.



Thank You!

