

Towards Radioastronomy and Space Science

Portugal report: Azores – S. Miguel Island

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Radioastronomy and space science

Political Frameworks:

- AIR Centre - a new Atlantic Initiative
- Portugal SPACE –new national space agency; HQ in Azores
- SKA – Full Member Observatory, March 2019 /Ratified Nov 2020

Infrastructures

- RAEGE (VLBI radiotelescopes, space geodesy)
- Pampilhosa – ENGAGE + 2 xWide FOV telescopes (2.5°x2.5°)
- SSA-SOLAR – ENGAGE
- FCT 15m tracking (Proba-3 and EO sats)
- Azores SATCOM /VLBI*

Cooperation

- AERAP - AFR-EU Radioastronomy Platform (2011-)
- DOPPLER - FCT-AKDN Cooperation PT-MOZ (2018-2021+)
- HOU - light HI telescopes
- (AIR centre – Atlantic cooperation and beyond)

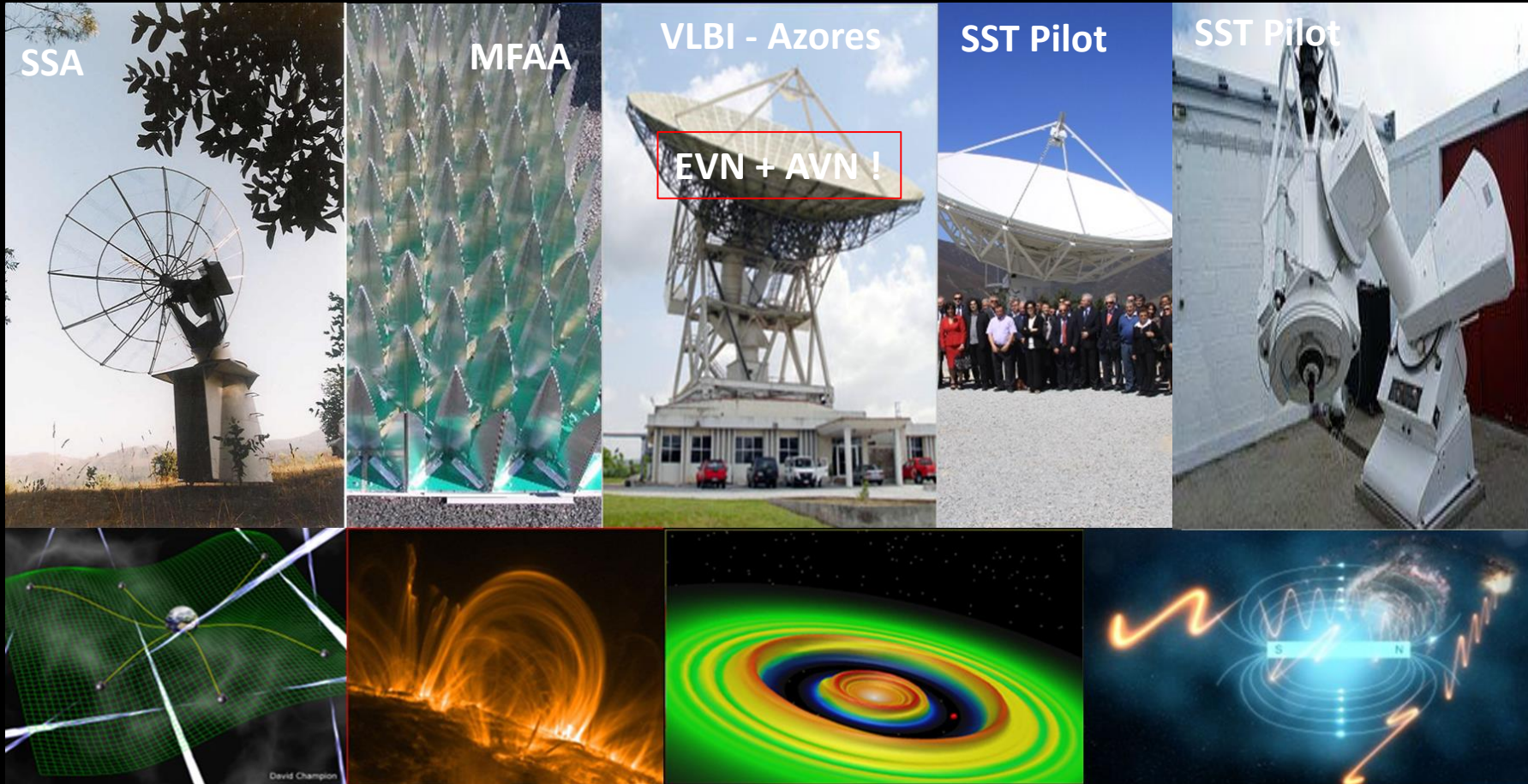
3.8M€ (2017-2020) - ESFRI aligned; Excellence

The only Astronomy Research Infrastructure in National Roadmap



Operate Infrastructure in Portugal: towards world class facilities; in Cooperation with AIR ; Sensors + Compute; HR Capacitation

Radioastronomy: Infrastructures – synergic with AIR



Initiating new program: SST pilots (Funded) , Dark Sky (Funded)

Azores VLBI: RAEGE VLBI 2010 Radiotelescope



- Geodetic VLBI in expansion
- Significant increase in radioastronomical capabilities, techniques & applications

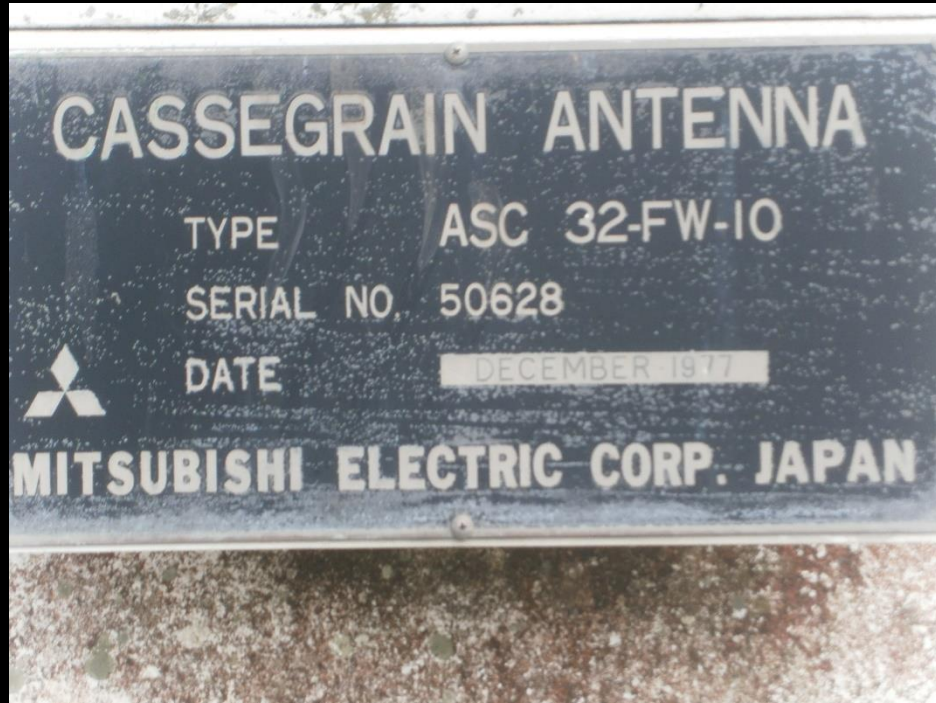


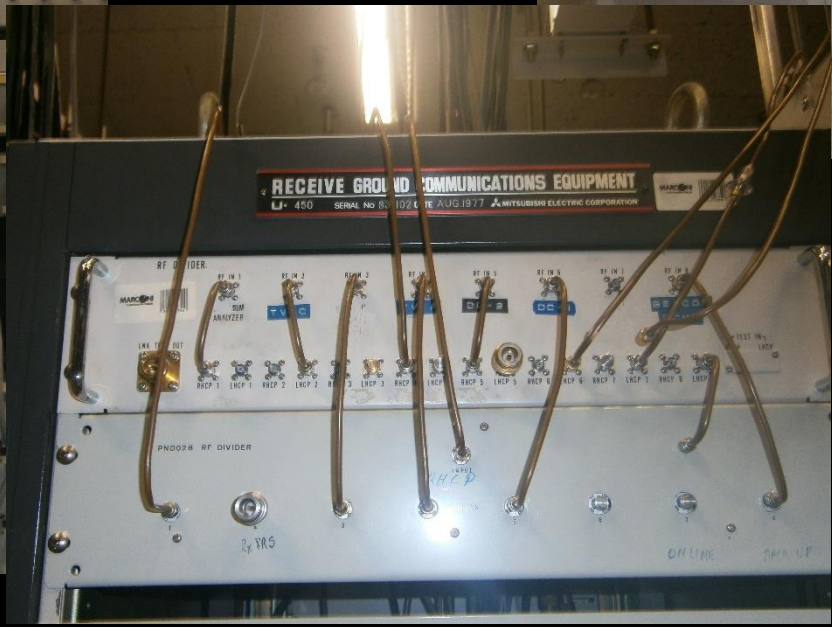
Enhancing Azores VLBI cluster (and single dish science world class) Great potential for EVN/AVN “integration” – PT/Azores/AIR synergies

Potential for VLBI station in São Miguel (Azores)



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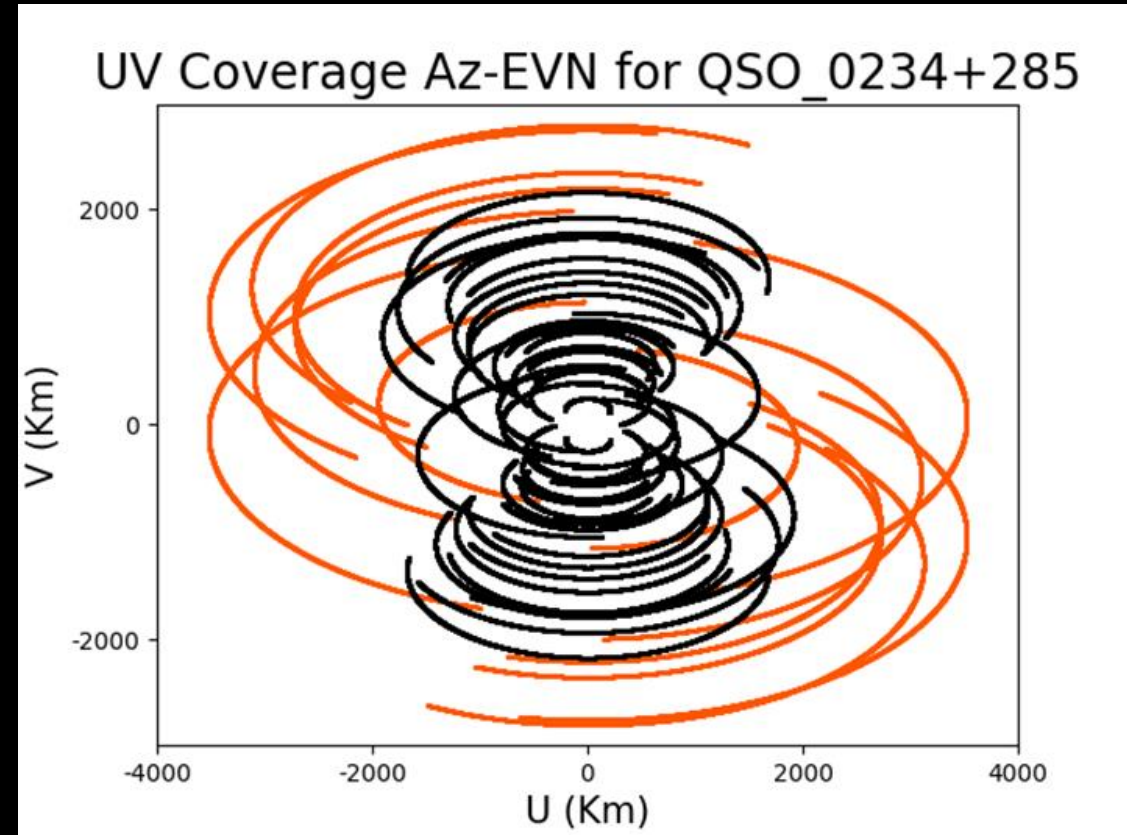




Enhancing Azores VLBI cluster

Great potential for EVN/AVN “integration” – PT/Azores/AIR synergies !

- Quasar observation simulation
- C-band
- Azores + European Stations only
- Azores in red, E-W baseline of great impact !!



Enhancing Azores VLBI cluster

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Quasar observation simulation

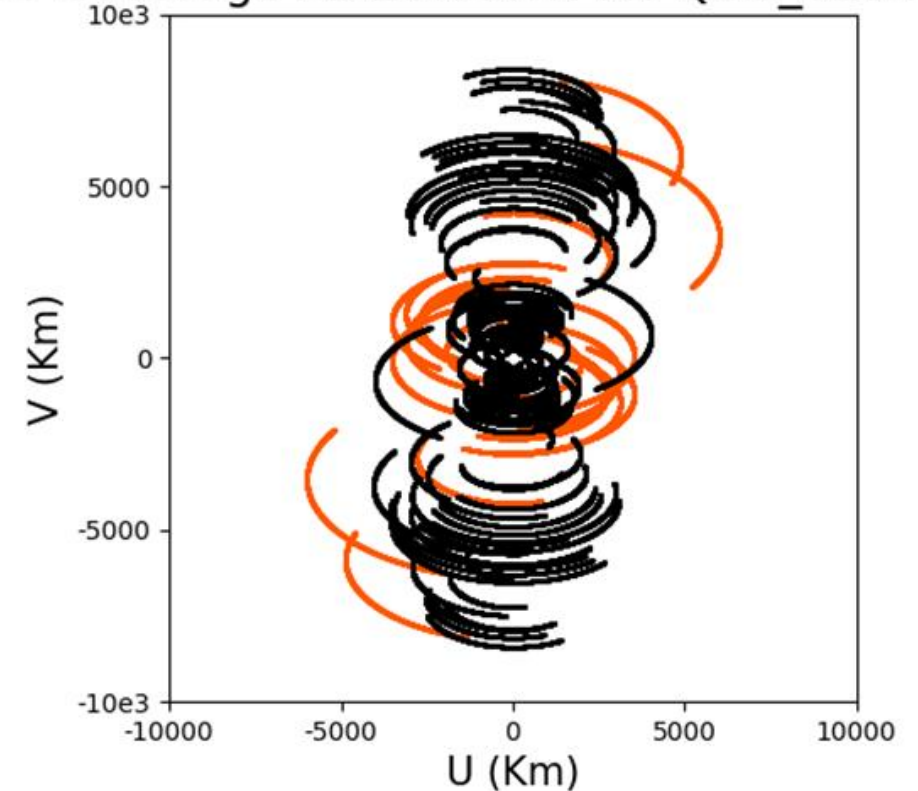
C-band;

Azores + European + Africa VLBI
Stations (Ghana, Kenya, South Afr)

Azores in red, E-W baseline of great
impact !!
Enhancing Africa and European VLBI
networks



UV Coverage Az-EVN-AVN for QSO_0234+285



Enhancing Azores VLBI cluster

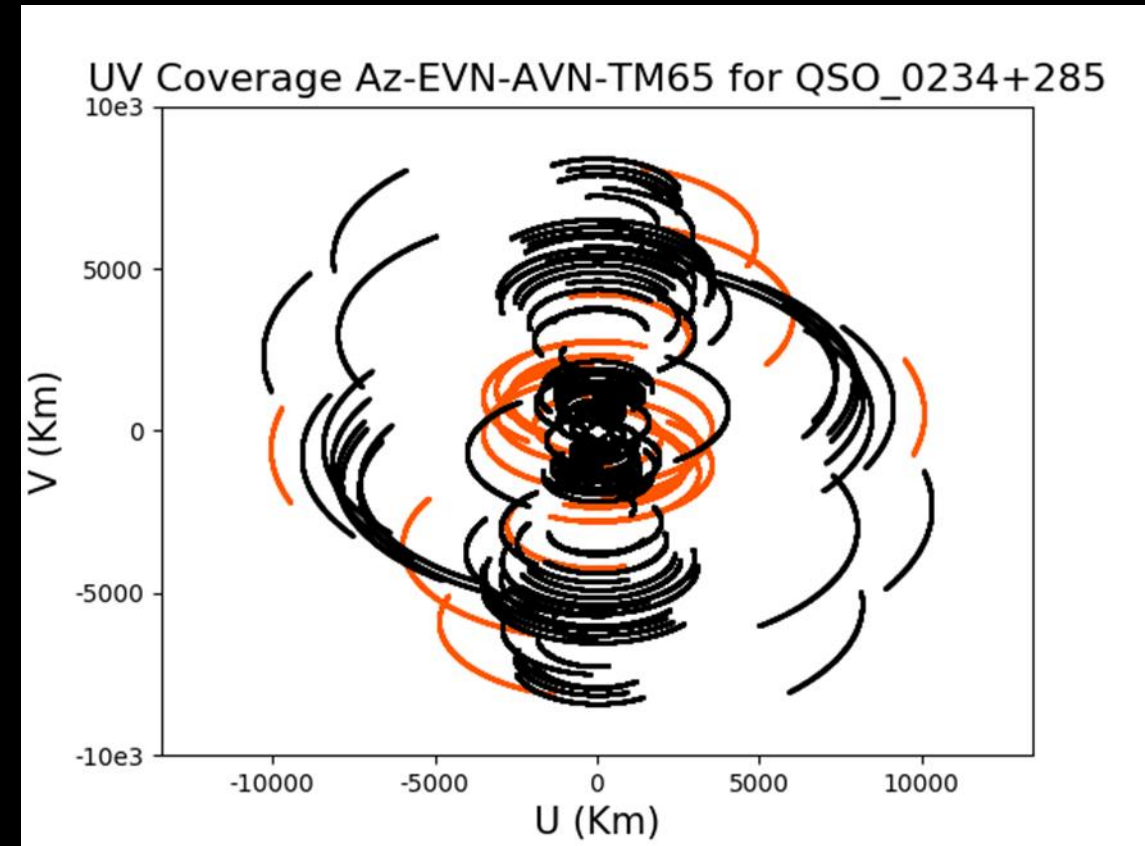
Great potential for EVN/AVN “integration” – PT/Azores/AIR synergies !

Quasar observation simulation

C-band; with African Asia networks

Azores + European + Africa + Asia (China)

Azores in red, E-W baseline of global impact – can provide world longest baseline
Exquisite spatial resolution



Enhancing Azores VLBI cluster

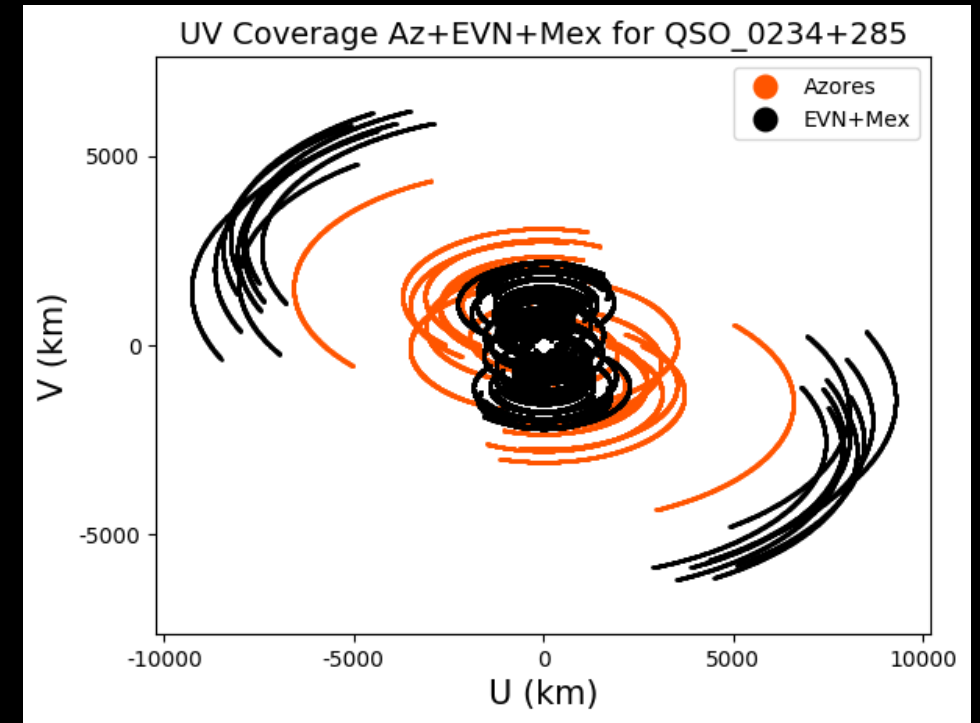
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Quasar observation simulation

C-band; w_i

Azores + European + Mexico

Azores in red, E-W baseline of global impact – can provide world longest baseline
Exquisite spatial resolution



- **32 –m dish ; Intelsat Standard A, decommissioned in S. Miguel**
 - Same Ghana, NZ antenna type
 - Mitsubishi
 - Owned by Altice (ex-PT Telecom/ex-Marconi)

- Early budget estimation (MT Mechatronics, Azo GOV): 2.5M€, 5 year projet, ~80% retour for Azores economy (mechanics, eletrical, receivers)
 - Control compound in very good shape and still maintained
 - 1Gbps optical link
- **Radio Service Exclusion zone (low RFI)**

- Possibility of time transfer from RAEGE St. Maria maser
 - White Rabbit – SKA/ EVN / CERN technology

- Regional GOV : 3.5M€ proposal submitted Oct 2020 (EU Resilience / structural Funds)
 - Regional Post-election period (GOV may change) – wait Dec 2020

