



The AVN

Huib Jan van Langevelde, director JIVE



The AVN

Why it is a great idea!
from the perspective of European VLBI

Huib Jan van Langevelde, director JIVE

- **EVN: European VLBI Network**
 - Consortium of (European) Telescopes
 - Includes Hartebeesthoek
- **JIVE: Joint Institute for VLBI in Europe**
 - **Funded by radio institutes and research councils**
 - NWO (NL), ASTRON (NL), STFC (UK), INAF (IT), ICN-IG (ES), OSO (SE), MPG (DE) CAS (CN), CNRS (FR), NRF (ZA)
 - NRF of South Africa joined last May
 - **Promote the use and advance of VLBI**
 - for astronomy
 - Central correlation; User services; Proposal handling; Network support; Innovation R&D
 - Exemplary science; EC liaison/representation

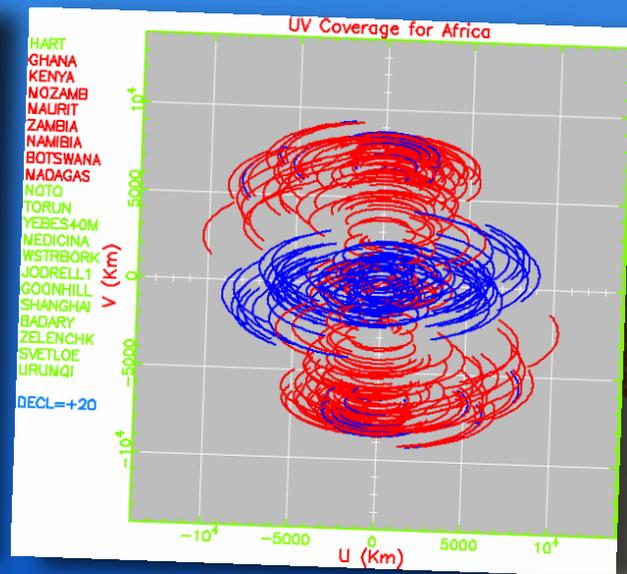
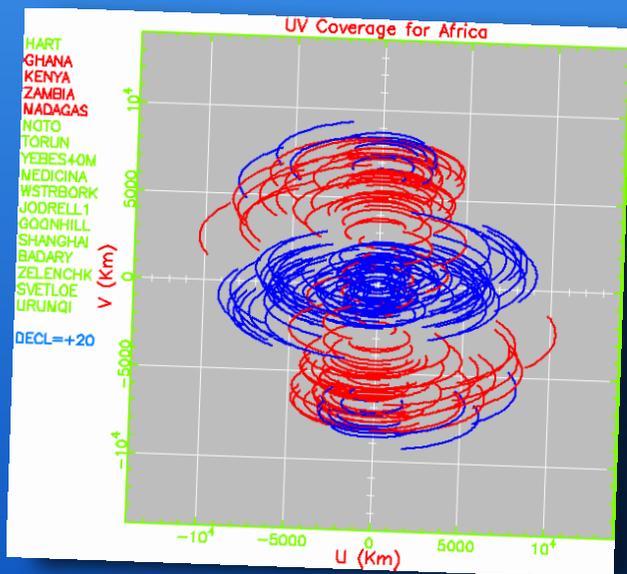
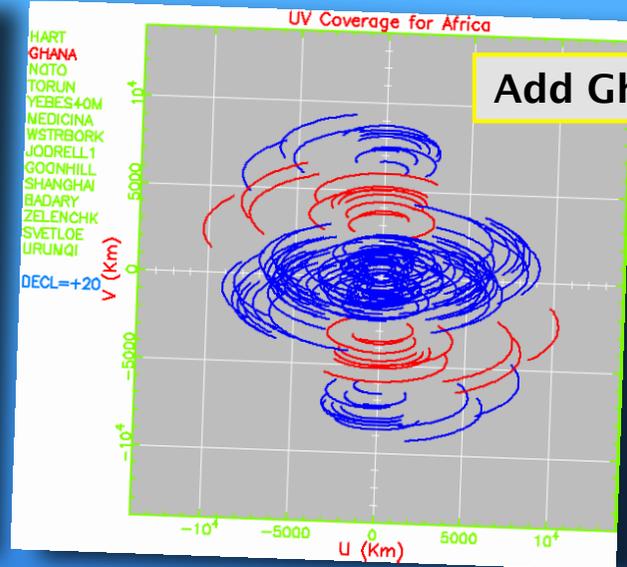
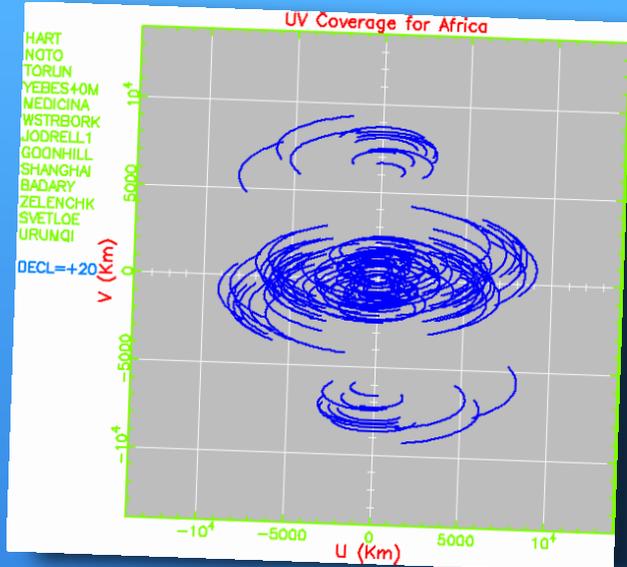


The European VLBI Network

- **Big telescopes in number of European countries**
 - Run by national agencies
 - Independent institutes
 - Or Universities
- **Partners outside EC countries**
- **Arranged in Consortium**
 - Signing MoU, commit to
 - Provide observing time in sessions
 - Compatible VLBI facilities
 - PC member, Board member
 - Contribute to tech pool
 - Shared/rotating management
- **Finances**
 - No exchange of funds
 - Buy parts
 - Contribute media to pool
 - But see JIVE part

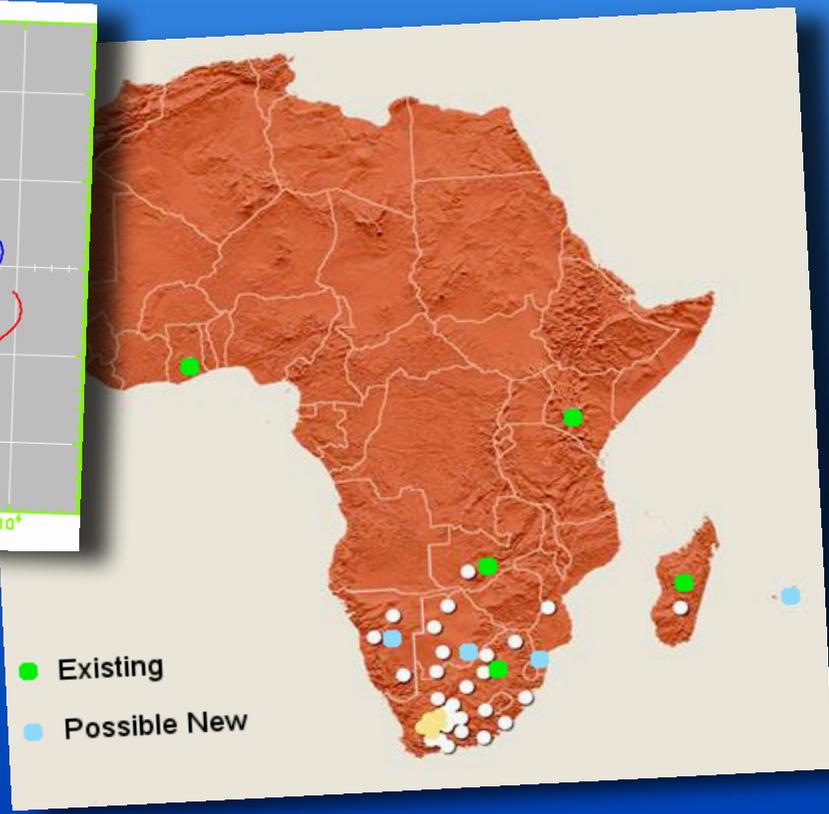


New big telescopes: Sardinia, Shanghai



Converted

Converted and new



VLBI for Space applications...

JUICE-Laplace

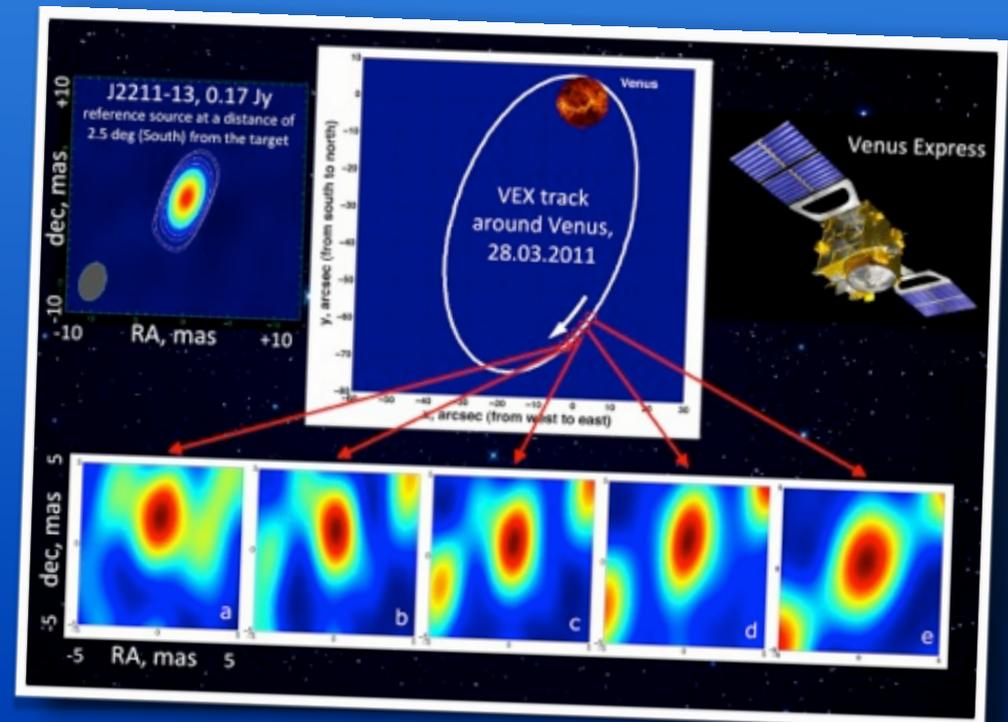
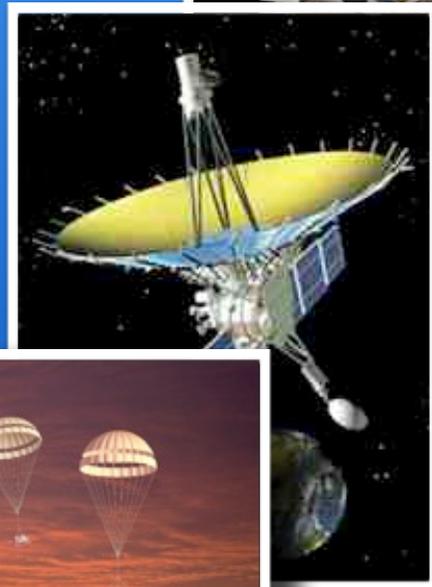
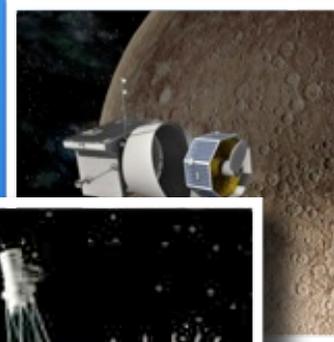
MarcoPolo-R?

ExoMars

BepiColombo

RadioAstron

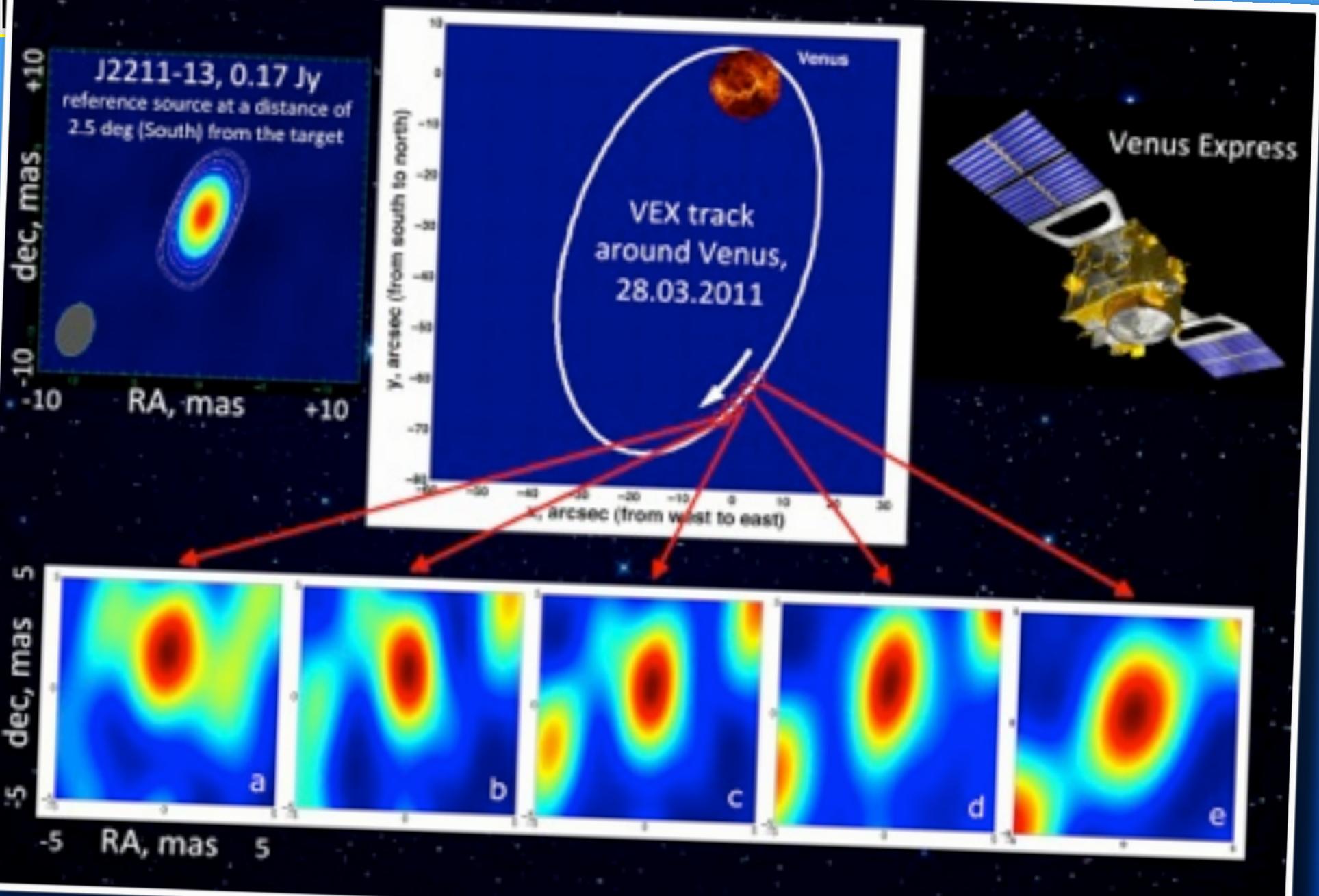
Huygens



VLBI for Space ap

Europa Jupiter System Mission

JUICE-Laplace



Rad

Huy



Opportunities for VLBI

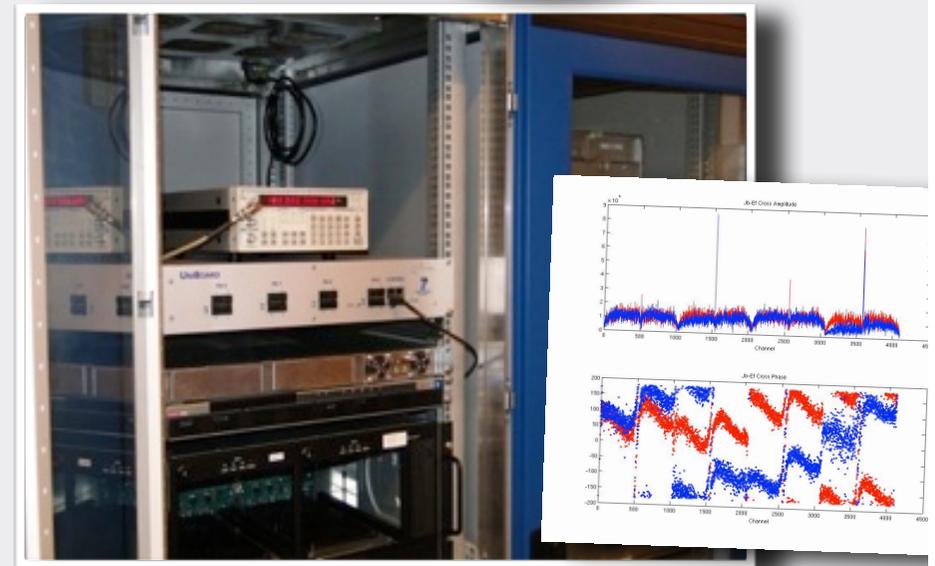
- **Science case is in good shape!**
 - **Extremely broad**
 - Fits to almost all themes that they can come up with
 - **Can do unique science**
 - Especially at global baselines
 - With very many telescopes
- **Constantly improving capabilities**
 - **Increasing number of stations**
 - Must merge operational procedures
 - Use of ALMA for VLBI
 - **African VLBI Network especially promising**
 - EC Written Declaration 45 on science collaboration
 - **With better sensitivity, more digital bandwidth**
 - More flexibility, tailored to user needs
- **Science synergy with new technology (survey) instruments**
 - SKA pathfinder in South Africa
 - LOFAR, Apertif
 - eMERLIN, EVLA
- **Eventually observe with SKA elements in Africa**



Prospect of the AVN:

- **Can do great science as stand-alone VLBI Network**
 - That is interesting to European scientists
 - Can do great stuff as part of Southern Array
 - With Australians
 - With South America?
 - Think about millimetre astronomy?
- **Can do great science with EVN**
 - Start of a truly global VLBI facility
 - Tailored for astronomical objectives
 - Ready for the SKA era
- **Will be a stepping stone in SKA partnership**
 - European collaboration in radio astronomy grew out of VLBI
- **And this is surely not a simple task**
 - Have seen this process before, e.g. with China, Latvia
 - Really requires exchange of best practices
 - Every element in the VLBI chain of instrumentation is crucial for it to work

- **e-EVN recognized as an SKA pathfinder**
 - For long-haul connectivity
 - And real-time radio astronomy
- **Synergy with survey instruments**
 - Transients, survey follow-up
- **Complementary to SKA_1**
 - Provide sensitive long baselines
- **Possible contributions to SKA from VLBI domain:**
 - **Technology development**
 - Digital equipment
 - Processing techniques
 - **People (aka capacity building)**
 - Training radio astronomers
 - And technical experts
 - Prepare for operations and user support



UniBoard first fringes

Opportunities

- **EVN ready to collaborate**

- Hart already there

- **JIVE ready to offer help**

- but a project would help

- **Help integrating telescopes**

- Correlation, checking integrity
- Calibration, positions

- **Technology**

- Backend compatibility
- Connectivity? Clock distribution?

- **User support/training**

- Schools, visitor programmes

- **Science policies**

- Proposal handling etc

- **Interfacing with EC programmes**

- NEXPReS
- Management of RadioNet accounts

- **JIVE aiming for European status**

- ERIC: European Research Infrastructure Consortium
- NRF already a partner



NEXPR_eS
Novel EXplorations Pushing
Robust e-VLBI Services


RadioNet

