

WP5: Integrating New Elements

Leaders: Pablo de Vicente - IGN/MFOM-E

Bob Campbell - JIVE

Time line: Start month: 1

End month: 48

WP5 Effort: 50.40 persons-month (JIVE)

The highest effort in all Wps

A tiger team may be required

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Tasks

- 1. Enhancements of existing EVN and affiliated stations
- 2. Supporting new telescopes
- 3. Station feedback from pipeline and archive

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Task 1 Enhancements of existing EVN and affiliated stations

- Verification of data quality and calibration for new bands at telescopes or for upgrades at existing telescopes.
 - For example: **Kunming 40m**, telescopes with 43 GHz Rx
- Incorporation of new MERLIN stations via **eMerlin** mode. Short baselines.
- Incorporation of phased array feed system **APERTIF** in Westerbork. To be used for wide field at 18-21 cm.
- **DSN - DVP** new backend debugging.
- Joint observations with LBA.
- Impact on the **MeerKAT** (South Africa)

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Task 1 Enhancements of existing EVN and affiliated stations

Support scientist

- Dedicated person @ JIVE
- Will be contacting stations with new Rx and data interfaces
- Will provide requirements for delivering calibration
- Will plan for tests and inclusion in the NMEs.

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Task 1 Enhancements of existing EVN and affiliated stations

Risks

- Including new bands for **Kunming**: Already done. No risk
 - Fringes @ L, C, M, X.
- Including **eMerlin** mode into EVN correlation: low
 - Going on, but slower than expected
- Including Westerbork & **APERTIF**: low - medium?
 - Not started yet
- Including new Rxs and data interfaces at telescopes: low (43 GHz tests)
- **DSN-DVP**. Already observed
- **LBA**. LBA mode → 5B done

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Task 2 Supporting new telescopes

- Make a census of European telescopes, status of institutions and needs to reconvert them into EVN ready radio telescopes.
- Potential instruments in:
 - **UK**. Old communication antennas (26m + 29m)
 - **Portugal** (Açores Islands). 30m
 - **Finland** (Finish Metereological Institute). 30M
 - **Ireland**
 - **FAST** (China)
- Study incorporation of new VGOS and old geodetic stations.
- Other non-european telescopes: **Thailand** (40 m), **UAEmirates** (40m)
- Support of a tiger team to accelerate the participation in the EVN

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Task 2 Supporting new telescopes

- Already have recent experience with some telescopes:
 - **Ghana.** In St. Petersburg round of talks with EVN experts and going on
 - **United Arab Emirates.** Exchange of emails with information and a simple roadmap to purchase equipment and how to start single dish observations.
- We can gather information to prepare a simple handbook for telescopes starting up.
- Already exists a list of requirements for EVN telescopes at the TOG wiki.
- **VGOS** telescopes could take part in the EVN when linear pols. circular pols. issue is solved. Bands: C and X. Still some work ahead.

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Task 2 Supporting new telescopes

Support scientist

- Dedicated person @ JIVE
- Inventory of stations and assesment of potential bottlenecks.
- Coordinated with the EVN TOG chair
- Responsible for scheduling and data inspection

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Task 2 Supporting new telescopes

Risks

- New telescopes in the 46 month period? Medium - High
- Thailand and UAE are probable projects. Medium-High risk
- Finland is also a probable project. Medium-High risk
- Portugal is a possibility. High risk
- UK. Medium - High risk
- Ireland. High risk
- Tiger teams from the TOG? to facilitate test observations

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Task 3 Station feedback from pipeline and archive

- Main goal: Provide **fast** feedback to stations about their performance to help improve it. It is strongly desired at the TOG
- Take profit of the interactive and public archive at JIVE.
- It contains correlated raw data, calibration data & preliminary images
- Changes will be made to allow telescope operators query their telescopes' performance.
- These changes will focus on calibrator observations.
- It will help to spot technical problems and amplitude calibration problems. Already in the TOG action items.
- Recent example related to this goal: amplitude calibration performance trend for each telescope. Presented at St. Petersburg's TOG meeting.

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Task 3 Station feedback from pipeline and archive

JIVE telescope support team

- Reengineering of the existing archive querying structure
- Who will evaluate the results products and present them to the TOG?

Risks

- Modification of the pipeline and data flow should be feasible. Low
- Fast feedback (not mentioned in the grant agreement). Low risk for NMEs. It depends on the correlation time and the turn around.

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Deliverables:

- D5.1: Reports to TOG by JIVE. Public report on month **18**
 - Several reports on tasks 1 & 2
- D5.2: Changes in pipeline & EVN archive interface by JIV-ERIC. Public available on month **42**
 - Pipeline and EVN archive interfaces for task 3 should be ready by then
- D5.3: Final report on integrating new elements by IGN/MFOM. Public report on month **46**
 - Final report on tasks 1, 2 and 3 by the end of the project