



JUMPING JIVE WP5: Integrating New Elements

Pablo de Vicente, Bob Campbell



WP5 tasks

- Task 1: **Enhancements** at EVN and affiliated telescopes.
- Task 2: **Supporting** new telescopes and creating an inventory of potential new facilities that could join the EVN in a short-term period.
- Task 3: **Improving** the station feedback from the pipeline and archive.



Task 1 Overview

1. Incorporate new stations operationally
 - e-MERLIN; 4 bands at Kunming
2. Hardware developments
 - New receivers: Q-band (Ys, T6, Ef, KVN); X (Tr); P (Jb)
 - Digital back-end / firmware testing
3. e-VLBI:
 - 3 Russian stations, Sardinia, KVN, e-MERLIN
 - 100 Gbps network capacity into Dwingeloo
4. Continuous-calibration systems
5. FlexBuff / e-shipping (all but 4 stations)



Task 1 Impact

1. JUMPING JIVE Support Scientist

- Coordinate/review tests // liaise with stations

2. Users benefit

- Array Composition
 - More short baselines, east Asian telescopes
 - Improving frequency coverage
- e-VLBI: array close to matching the disk-based one
- Network capabilities
 - 4 Gbps for $\lambda \leq 6\text{cm}$
 - Better band-pass shapes, improved set-up reliability
- Continuous-cal:
 - improved amplitude calibration, ease of scheduling



Task 2 Overview

New stations that could join/participate with the EVN

1. New construction: *e.g.*, TNRT 40m (TH), MeerKAT (ZA)
2. Geodetic antennas: *e.g.*, Santa Maria RAEAGE (PT)
3. Repurposed communication antennas
 - Kuntunse (GH), Zolochiv (UA) [have joined NMEs]
 - Hellenic (GR)
4. Other: uGMRT (IN), ROT 54/2.6m (AM)



Task 2 Impact

1. Knowledge Exchange

- EVN → new sites
 - Technical Advisory Committees, Site Visits
 - International Conferences (*e.g.*, uGMRT, Zolochiv)
 - Training Visits (*e.g.*, Kuntunse — along with WP9)
- New sites → EVN
 - Station personnel participating in EVN TOG & CBD meetings, as well as IVS TOW workshops

2. Path for EVN growth / globalization of JIVE (*e.g.*, WP3)

- EAVN, towards LBA
- AVN, road to SKA-MID (*e.g.*, WP10)



Task 3 Overview

1. Databases designed to drive station-based presentation
 - Automatic loading: pre- and post-correlation sources

2. Front-end web interface: grafana
 - Customizable station querying, dashboards

3. mattermost chosen as intra-EVN communication channel
 - Server installed at JIVE for EVN-wide access



Task 3 Impact

1. Station uptake
 - 9 station-specific dashboards, plus one for the VLBA
2. On-going discussions about how to improve
 - Computation of statistics
 - What to collect/present in light of equipment evolution
2. Implications of a centralized monitoring system (WP8)



Use of Resources // 1-sentence take-away

1. JUMPING JIVE Support Scientist

- 80% WP5; 2 distinct people over the 4+ years
- Handle tests; confer with stations; TOG presentations
- Designed the new capabilities in Task 3

2. Travel support

- Vital aspect — fosters community building
- COVID-19 restrictions curtailed personal/hands-on visits

Groundwork laid for JIVE playing a principal role in the Global VLBI Alliance, an IAU working group.