

JUMPING JIVE

WP6 - Geodetic capabilities

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JIVE

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Objectives of WP6

- Enable geodetic use of the EVN software correlator at JIVE (SFXC)
 - Make « totals » available in output data
 - Add capability for handling geodetic-style schedules
- Validate newly-implemented geodetic capability with test observations
- Carry out at least one full-scale geodetic observation
 - Determine positions of EVN telescopes that do not participate in standard IVS observation



Task 1: data interface

- **Attach a priori correlator model to the output data**
 - Accounts for Earth-sky geometry and propagation effects
 - Currently not included in the data files that the user receives
- **Implementation**
 - Develop appropriate interface to include « totals » in the correlator product
 - Should include possibility of producing different output formats: FITS, VGOSDB,...
 - Needs verification of consistency of delay model calculated at any time with its numerical representation in output data



Task 2: experiment definition

- **Ability to handle geodetic-style schedules**
 - Geodetic and absolute astrometry observations rely on obtaining atmospheric calibration over the whole sky
 - Use sub-arrays so that different areas of the sky could be scanned within a short period of time over each station
- **Implementation**
 - Correlator must be able to interpret sub-netted schedules seamlessly
 - Correlator must be able to read in different schedule formats e.g. SKED, VieVS, besides the current SCHED format.



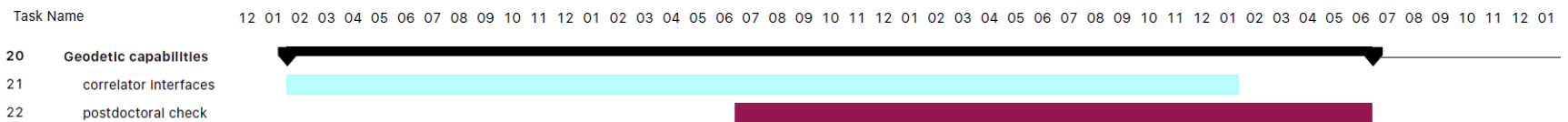
Task 3: application to station positions

- **EVN (non-geodetic) station positions determined from 6 cm & 1.3 cm experiments**
 - Experiments conducted in 2000 and 2006
 - Plate motion model applied to get locations at later epochs
- **Repeat such observations with two objectives**
 - Measure the site velocity empirically, taking advantage of the long-enough time-baseline ($> 10-15$ yr) between observations
 - Test the newly-implemented geodetic capability of the JIVE correlator on actual data



Staff effort

- Person-months
 - JIVE: 12 months
 - CNRS: 24 months
- Runs from Month 1 to Month 42





Deliverables

- **Month 12 (01/02/2018)**
New correlator data products, verified for use with geodetic software
- **Month 18 (01/08/2018)**
Software to deal with geodetic observing schedules, verified by test observations
- **Month 40 (01/06/2020)**
Document with analysis of EVN station position determination



Risks

- Not being able to find a suitable candidate to carry out the work in Bordeaux
- Proposal to get EVN observing time to measure the geodetic positions of the EVN stations not approved
- Failure of EVN observations



Benefits for community

- Allow one to use the JIV-ERIC infrastructure for high-accuracy geodetic and astrometric applications
 - Determine absolute source positions (ICRF)
 - Determine telescope positions
- Allow one to compare relative astrometric positions at different epochs even if correlator model changed
- JIVE correlator may be used to supplement current IVS correlators
 - if there is a need and it does not detract from EVN operations