

POSSIBLE NRAO CONTRIBUTIONS TO VSOP

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ABSTRACT

The U. S. National Radio Astronomy Observatory is interested in contributing to VSOP and to other orbiting VLBI missions in various ways. These include co-observing with ground radiotelescopes, processing recorded data with the VLBA correlator, making available image processing facilities and software, and building and operating an earth station for communication with the spacecraft. These tasks can be accomplished if the incremental costs are paid by the space agencies and if policies are established that insure open access to observers and impartial review of proposals.

The proposed contributions of the National Radio Astronomy Observatory (NRAO) to VSOP are summarized in this paper.

First, the Observatory is prepared to commit up to 30% of the scheduled observing time on the VLBA to orbiting VLBI (OVLBI) co-observing. It is presently estimated that this will be about 1800 hours per year, after accounting for testing and maintenance time. During periods of simultaneous operation of more than one orbiting telescope (as is expected for VSOP and Radioastron), this represents the total commitment to all of them. Other telescopes operated by the NRAO are expected to be very important to OVLBI, including the phased VLA, the 140-foot telescope, and the new Green Bank Telescope (GBT). The GBT will be operational in 1995 and will have an aperture of 100 m. Proposals to use these instruments with VSOP will be considered individually, in competition with other uses.

Second, the VLBA correlator will be made available to process all observations in which NRAO telescopes have participated. Since the correlator is designed to operate faster than observing, additional time may be available; allocation of this time will be made competitively. In any case, it is necessary that all recordings be fully compatible with those made at the VLBA. This means that, at correlation time, the data must be on tapes that are readable by a VLBA playback machine. It is therefore preferable that all recordings worldwide be made on VLBA-compatible machines. However, in the event that it is necessary

for some stations to use another recording medium or format, the NRAO could construct and operate equipment that will copy such data to VLBA tapes for use at the correlator.

Third, the NRAO's extensive image processing facilities will be available to the community for analysis of OVLBI data. Software required to support such work will be developed.

Finally, an earth station can be built and operated at the NRAO's Green Bank site to communicate with VSOP, Radioastron, and perhaps other OVLBI satellites. An existing 14-m antenna is available for this purpose. The station will provide the necessary two-way phase reference transfer and the wideband digital downlink and recording. It can be ready for operation in March 1993, well in advance of the expected launch dates.

It is important to emphasize that the NRAO's funding from the National Science Foundation covers only its traditional role of providing ground-based radio astronomy instrumentation. To the extent that the OVLBI activities result in extra costs, these must be funded by the space agencies. Also, it has long been a fundamental policy of the NRAO that its facilities be open equally to all qualified scientists and that proposals be subjected to impartial peer review; NRAO's participation in OVLBI must be consistent with this. Lastly, it should be understood that some of these commitments (especially allocation of telescope time) cannot be continued beyond a reasonable initial phase unless they are justified by the scientific return.