The Canadian S2-VLBI-System

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Abstract

The S2 VLBI System was developed in Canada as a low cost, high preformance, 128 Mbit/sec VLBI system for use in geodesy and astrophysics. It consists of the S2 VLBI Data Acquisition System, the S2 VLBI Data Record System, the S2 VLBI Data Playback System, and the S2 VLBI Correlator. To date there are approximately 55 S2 VLBI Data Record and Playback systems in use for various astronomical purposes in more than a dozen countries. The S2 VLBI system features a frequency agile local oscillator for geodetic applications of group delay measurements by bandwidth synthesis (BWS) over 900 MHz as well as a frequency agile VLBI correlator for processing frequency switched VLBI observations. The S2 VLBI correlator also features multiple tone extractors and pulsar gating capabilities as well as high frequency lobe rotators capable of processing space VLBI observations with ther attendant high Doppler rates. There are, in addition, three other "S2 Capable" VLBI correlators located in Sydney Australia, Mitaka Japan, and St. Petersburg Russia, with a fourth under development at the Astro Space Center in Moscow. These correlators are not designed to accommodate all the features of the S2 system, in particular frequency agile signal processing, but are nevertheless capable of processing S2 VLBI data tapes in a subset of S2 operational modes. The Mitaka correlator processes S2 data tapes by using S2 VLBI Data Playback Systems to copy them to VSOP data tapes before correlation. Other S2 correlators make use of S2 VLBI Data Playback Systems for direct input to the correlator The Space Geodynamics Laboratory has begun development of the S3/S4 family of VLBI Data Record and Playback systems which will operate in the range from 1024 Mbit/sec to 4096 Mbit/sec and will feature a robotic tape changer for 24 hour unattended operation.

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