A Test of WVR-based Tropospheric Delay Calibration Using VLBI Observations on a 20 km Baseline

R P Linfield, B L Gary, S J Keihm, M J Mahoney, L P Teitelbaum, R N Treuhaft, S J Walter, J Z Wilcox (Jet Propulsion Laboratory, 4800 Oak Grove Dr., Pasadena, CA 91106; e-mail: rpl@logos.jpl.nasa.gov)
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Six sessions of S/X band Very Long Baseline Interferometry (VLBI) observations on a 20 km baseline at Goldstone, CA were conducted in April and May 1993, using a 26 m and a 34 m Deep Space Network (DSN) antenna. An array of troposphere calibration instruments were used during these observations, and included a Water Vapor Radiometer (WVR) within 50 m of each of the two radio antennas, a Microwave Temperature Profiler at one site, radiosonde launches approximately every 6 hours at both sites, and surface meteorology at both sites.

This experiment was designed to test the error budget for WVR measurements, and to allow for a refinement in path delay retrieval algorithms. A preliminary analysis of the data has shown a substantial reduction in the scan-scan rms residual VLBI delay scatter using standard statistical retrieval algorithms for WVR line of sight delay estimates. Results will also be presented for advanced, or customized retrieval algorithms.

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3. (a) R P Linfield
   238-700
   JPL
   4800 Oak Grove Dr.
   Pasadena, CA 91106
   (b) Tel. 818-354-2806
   (c) Fax. 818-393-4965
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