

HOLOGRAPHY 004

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

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Telephone: 781-981-5409
Fax: 781-981-0590

To: Holography Group

From: Alan E.E. Rogers

Subject: Sensitivity tests of radome correction

The following table compares the radome correction for 1.6 degree scan width made for the reference position of $az = 230.677$ and $el = 26.75$ with radome corrections with different parameters. The reference has an rms of 144 microns and virtually no focus error or astigmatism.

Parameter Change	rms difference microns	Notes
Added higher order holography to rms included	38	1
Changed scan width to 1.4 degrees	75	4
Added random phase of 20 degrees for each az scan	69	2
Included elevation tilt offset -0.134 degrees	12	3
Elevation tilt of -0.5 degrees	61	
Offset satellite elevation by 0.1 degrees	41	
Offset satellite elevation by 0.2 degrees	50	
Offset satellite az and el by 0.5 degrees	110	

Notes:

1] Terms in the square of azimuth and elevation offsets in equations 5 and 11 of Rogers et al. IEEE Trans Ant. & Prop, 41, No 1, 1993 pp. 78.

2] See Holography memo #3

3] The shift of the radome diffraction pattern with the antenna tilt used for correction of feed offset and subreflector tilt has been incorporated into a new version of the radome diffraction code. In general the effect of this tilt is smaller (and not equivalent) to an equal change in the assumed satellite position.

4] It is critical that the scan width for the radome correction accurately match the scan width used in the holography.