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To: Holographers

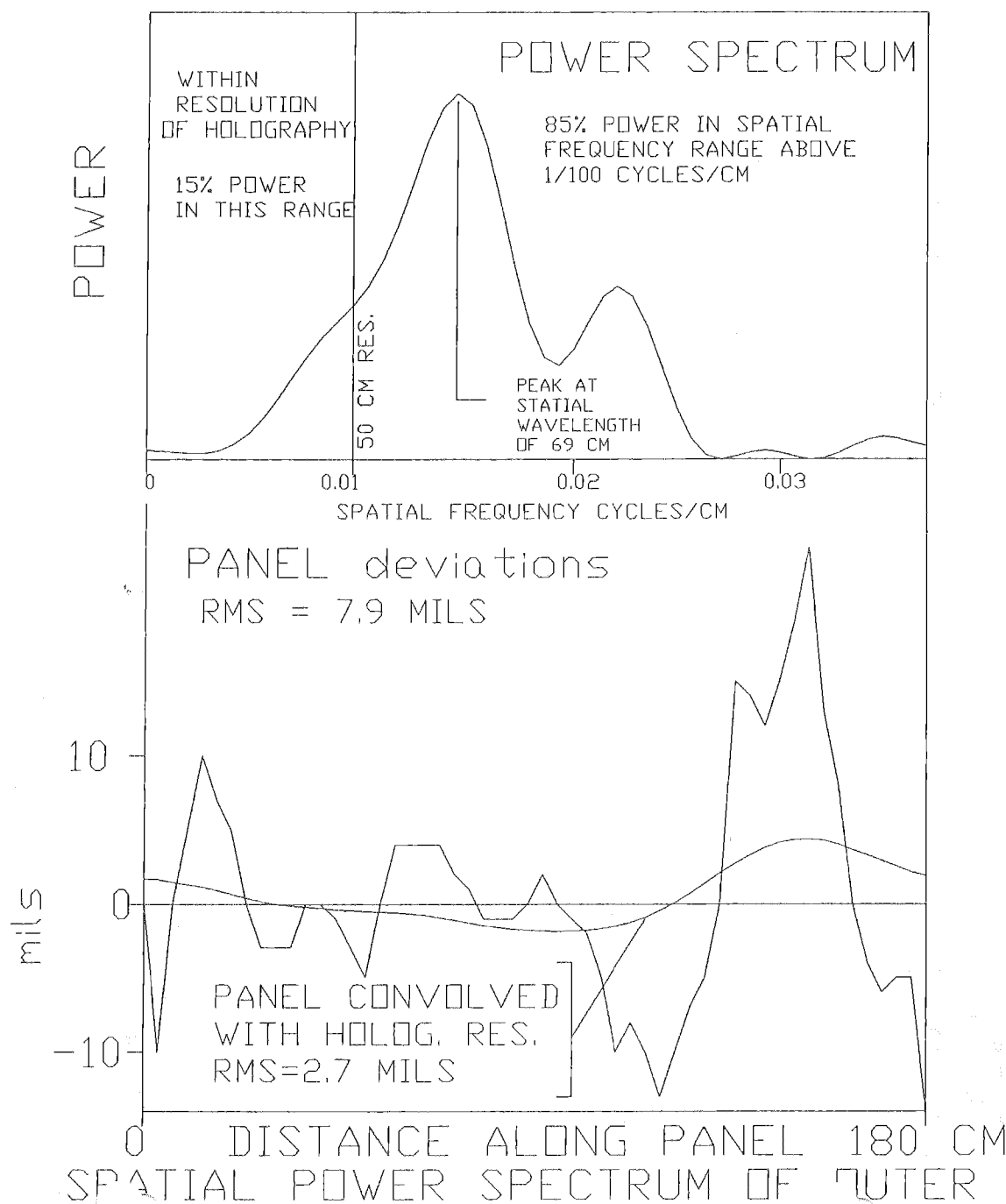
From: Alan E.E. Rogers *A.E.R.*

Subject: Panel structure unresolved by 91x91 holography

I have calculated the spatial power spectrum of a panel in the "O" ring sample (this is the only region in the outer part of the dish for measurements which were reported by SGH), and find that a large fraction of the power is at spatial frequencies beyond those sampled in the 91x91 holography. ¹At Brian Corey's suggestion, I have also plotted the panel deviation convolved with the 91x91 holographic resolution function.

The SGH memo gives an rms of 8 mils (including anomalies) for the outer panel samples. For the example shown in the attached figure, the SGH report gives an rms of 7.6 mils while my hand-sampled digitization gives 7.9 mils. Most of the scatter power in this panel is beyond the holography cut-off but within 0.025 cycles/cm. 0.025 cycles/cm at 115 GHz produces scatter power at an angle of 0.38 degrees. This is consistent with the sunscan data which shows most of the scatter to be power within 0.4 degrees.

¹Added sentence.



91x91 HOLOGRAPHY MAPS ARE MADE FROM A CIRCULAR WINDOW OF RADIUS $0.032 \times 45 = 1.44$ DEG = 0.0251 RADIANS.

HOLOG. WAVELENGTH = 2.54 CM SO THAT 0.0251 RADIANS SAMPLES A SPATIAL WAVELENGTH OF $2.54 / 0.0251 = 101$ CM (3.31')

A SPIKE ON THE ANTENNA PRODUCES SIDELobe POWER UNIFORMLY SPREAD OVER THE CIRCULAR WINDOW WHICH IN TURN GIVES A SINC FUNCTION WITH HALF POWER FULL WIDTH OF 50 CM. WHICH HAS BEEN CONVOLVED TO SHOW WHAT THE HOLOGRAPHY SEES

THE SPECTRAL PEAK AT 69 CM SPATIAL WAVELENGTH IS BEYOND THE MIN. WAVELENGTH SAMPLED BY THE 91X91 HOLOGRAPHY

PANEL DATA IS HAND DIGITIZED FROM PLOT OF O RING PANEL IN 5 SEPT 89 MEMO APPENDIX FILE: 060E52

$r = 544.23$ IN
rms = 7.6 MILS