

Interoffice

National Radio Astronomy Observatory

Charlottesville, Virginia

February 4, 1977

To: B. Peery

*25 Meter Millimeter Wave Telescope  
Memo # 71*

From: W-Y. Wong

Subject: Non-Homologous Deformations of the 25-M Telescope Design

The backup structure of the 25-M design has an error of 16  $\mu\text{m}$  rms due to various non-homologous deformations. This value is stated in Table III.1 in the proposal as a single item for a succinct purpose; it results from a combination of errors which were not taken into consideration during the structural optimization. These contributions are discussed in great detail in various reports as well as in the 65-M design proposal. I shall not repeat these discussions except to summarize the analytical results based on the 25-M design:

RMS Surface Deviation from Homology ( $\mu\text{m}$ )

	<u>Zenith</u>	<u>Horizon</u>
residual of homology optimization	5	3
+ 1/4 inch inaccuracy in joint locations	12	8
use of commercially available structural shapes	3	1
increase of weight, decrease of stiffness due to special joint design	4	1
+ 3% inconsistency of bar area	<u>14</u>	<u>4</u>
RSS	20	9

standard deviation = 16  $\mu\text{m}$