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Fifth Quarterly Progress Report
(April - June 1974)

"A Cloud Physics Investigation
Utilizing Skylab Data"

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During this reporting period progress in a number of the task areas was made.

Task I - Transmittances

    a. Oxygen "A" Band.

Calculations were performed for the apparent spectral resolution (about 20 nm) of the S191 at 753.0 nm and 762.0 nm. Calculations were also performed for a radiometer of 5 nm resolution. The results indicate that deconvolution will add significantly to our analysis.

    b. 2.0 μ m CO_2 Band.

A copy of the Selby and McClatchey [1] program, Lowtran II, has been obtained and is being modified to run on the NOAA computer. A simple analytical model of the S191 filter has been constructed and will be used to compute transmittances for our experiment.

Task II - Scattering Calculations

This task has been completed.

Task III - Cloud Models and Return Signals

    a. Cloud Models.

This task has been completed.

    b. Returned Signals.

Pending completion of Task Ib, we plan to combine the results of Tasks I, II, and IIIa with appropriate instrument spectral response data to simulate results.

Task IV - Deconvolution Procedure

Analytical models for the filter responses of the S191 have been developed. Mr. H. Fleming has begun writing programs to do the deconvolution.

Task V - Background Meteorological Data

Some S190 photographs of cloud cover were received during this reporting period.

Task VI - Analysis of Satellite Data

Raw data tapes for 16 days have been received. Programs to read the tapes have been written. Programs to convert counts to radiances and wavelengths are being written. Preliminary analysis indicates a wavelength calibration discrepancy. This is being checked further and hopefully will be discussed at EREP PI Meeting July 16-18.

Travel

No travel was performed during this reporting period.

Reference

1. Selby, J. E. A. and R. M. McClatchey, "Atmospheric Transmittance From 0.25 to 28.5 μm: Computer Code LOWTRAN 2. AFCRL-72-0745, AFCRL, L. G. Hanscom Field, Bedford, Massachusetts (December, 1972).