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MONTHLY REPORT

for

April 1980

VISSR Atmospheric Sounder (VAS)
Development and Performance Evaluation

Contract No.: NAS5-21965

Prepared by

Space Science and Engineering Center
The University of Wisconsin
Madison, WI

for

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD

I. General

On April 1, 1980 P. Menzel of SSEC traveled to El Segundo, California to participate in the VAS-E Calibration and Acceptance Test. On April 16 and 17, 1980 R. Daly, P. Menzel and F. Mosher attended the VAS Working Group Meeting in Greenbelt, Maryland.

II. Data Processing System Development

The ADCCP link to Wallops has been tested in a loop back mode through the modem at Wallops. Further testing awaits the installation of the VAS SDB. The mode AA frame sync and archive units were tested with the borrowed mode AA simulator. The frame sync had a timing problem which was corrected. Test simulator data was recorded on the archive for use in testing the VAS preprocessor. The preprocessor should be ready for the May 19, link-up test; firmware installation is nearly complete. The VAS ingestor software for the data base manager is ready for link-up test. Arrangements have been made with NESS to archive GOES-3 data during the link-up test. Our west antenna will be moved to point at GOES-2 during the entire link-up test week.

The remote NESS terminal at Kansas City is being used heavily. The forecasters are making use of the real time GOES data and the analysis capabilities of the McIDAS. The remote sounding data from TIROS is being processed routinely at Wisconsin for use by Kansas City. Several severe storm days which had good TIROS sounding data are being studied by Kansas City to determine the usefulness of this extra sounding data.

III. VAS Instrument Support

With the likelihood increasing that the VAS Demonstration will be conducted on VAS E instead of VAS D, the SSEC task of instrument support has been expanded

to include VAS E. The initial analysis of VAS E vacuum test data has yielded the following conclusions: (a) the test temperature gradients again resembled expected inflight gradients and allowed accurate determination of baffle forward (BF) and secondary mirror shield (SMS) calibration coefficients; (b) for spectral band 8, $C_{BF} = .123 \pm .051$ and $C_{SMS} = .198 \pm .018$ giving for the 28 test produced gradients an offset of -2.23 ergs/etc. and an rms error of $.45$ ergs/etc.; (c) a larger non-linearity in band 8 was measured; and (d) the results generally were comparable with those of VAS D.

An initial set of data was generated that describes orbit and altitude, calibration data, detector geometry, and processor data loads for the Synchronizer Data Buffer System. These data will be used in the May 19-26, 1980 link tests. Revisions and updates will be necessary when SSEC receives the VAS D Test Data Book from SBRC.

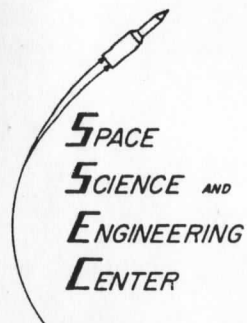
IV. VAS Data Processing Technique Development

Research work has been concentrated in three areas: a) coincident processing of TIROS and GOES data, b) algorithm development for temperature moisture profiling, and c) software development to access NMC fields from Suitland and analysis/forecast fields produced on the CRAY at NCAR. The first effort has been focussed on processing MONEX data. The TIROS has been used to successfully calibrate the GOES IR much as it will be with VAS. The second involves improving the moisture distribution by more sensitive retrieval methods and improved cloud modeling using (instead of avoiding) the cloud contamination. The third effort has succeeded in establishing routine access to NMC data on McIDAS and several instances of successful data transfers from NCAR to McIDAS.

Using the 101x71x10 version of the University of Wisconsin's numerical

weather prediction model, a 9-12 hour continuation forecast for 10 April 1979 (relative to a zero hour of 1200Z 10 April) has been re-run with an alternative treatment of the 9-hour 1000-mb heights (mean sea level pressures). This change embodies a first attempt to avoid the previous 9-12 hour forecast's excessive (~10 mb) deepening of the dominant Colorado surface low. As in the previous forecast, all other fields were initialized by running the ANMRC analysis with TIROS-N satellite temperatures and thicknesses from three orbits on the 9-hour (2100Z 10 April) output from a straight 0-12 hour forecast, which in turn had been initialized with a no-data NMRC analysis of the 0-hour (1200 10 April) LFM analysis output. The 1000-mb heights (mean sea level pressures), again not changed by the ANMRC analysis, were obtained by linear time interpolation between the two nearest LFM analyses available, from 0 and 12 hours. The resulting forecast showed nearly as much deepening as before, suggesting that the over-deepening may have other causes (i.e., other than inconsistency between mean sea level pressures and fields further aloft), though any conclusive statement must await closer study of the microfilmed field displays for this latest run.

Paul Menzel



THE UNIVERSITY OF WISCONSIN

1225 West Dayton Street
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10 May 1980

Ms. Vanessa Scott
Code 269, Bldg. 16
Goddard Space Flight Center
Greenbelt, MD 20771

Dear Ms. Scott:

In accordance with Article III of Contract NAS5-21965, I am submitting the required Progress Report for the month of April 1980.

If you have any questions or desire further information, please contact me at (608) 263-2268.

Sincerely,

Frederick R. Mosher

Fred Mosher
Program Manager

FRM/rcs

Enclosure

cc: H. Montgomery, Code 942 (10 copies)