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FY99 Final Report

Engineering and Scientific Support for the National Polar-orbiting Operational Environmental Satellite System Airborne Sounder Testbed - Interferometer (NAST-I) Instrument

30 September 1999

Contract Information:

This is the final report for the University of Wisconsin proposal entitled, "Engineering and Scientific Support for the National Polar-orbiting Operational Environmental Satellite System Airborne Sounder Testbed - Interferometer (NAST-I) Instrument". This proposal was in response to NASA Langley Research Center Procurement Request Number GLD.2056 under Contract Number NAS1-99123. Principal Investigator on this University of Wisconsin proposal is Dr. Henry E. Revercomb, Senior Scientist, Space Science and Engineering Center, UW-Madison.

Project Description:

The proposed tasks and deliverables identified by the contract are outlined below as modified by the exceptions called out in the UW proposal.

Task 1: Analysis of NAST-I data along with SHIS & AERI data from the CAMEX-3 mission during August/September 1998 and analysis of NAST-I data along with either SHIS or HIS data from the WINTEX mission.

Deliverable: Contractor shall provide a report documenting the operational functionality of the NAST-I Instrument and a comparison of the spectra achieved from NAST-I, AERI, and SHIS (*from selected flights mutually agreed upon by UW and LaRC*) during the CAMEX-3 field experiment. Contractor shall also provide a comparison of the spectra achieved from NAST-I and either SHIS or HIS during at least five flights of the WINTEX field experiment in March 1999. Contractor shall furnish copies of at least two papers of the CAMEX or WINTEX data and analysis submitted to referenceable publications in trade journals or conference proceedings.

Task 2: Improvements to the NAST-I instrument

Deliverable: Contractor shall provide not more than 5 reports detailing their solutions to the problems identified above as requested by NASA LaRC through the period of instrument improvements at NASA LaRC.

Task 3: Weather Products Test Bed

Deliverable: Contractor shall provide meteorological sounding data products from *selected data sets mutually agreed upon by UW and LaRC*. Contractor shall also provide retrieval algorithms to process meteorological data.

Task 4: Algorithm Development

Deliverable: Contractor shall provide monthly technical status reports and a final report at the completion of this task. Contractor shall also provide the electronic code for the algorithms developed along with programmer and user documentation.

Deliverables by Task:

Task 1

- Report documenting the operational functionality of NAST-I during CAMEX-3
 1. NASTI Detector Nonlinearity Summary
URL: http://danspc.larc.nasa.gov/NAST/Talks/990225_Tobin/index.html
 2. NASTI Validation: Comparison with HIS from Wallops 98
URL: http://danspc.larc.nasa.gov/NAST/val_his.html
 3. NASTI Validation: Comparison with AERI from Wallops 98 :
URL: http://danspc.larc.nasa.gov/NAST/val_aeri.html
 4. Data Processing Summary
URL: http://tyler.ssec.wisc.edu/~bobk/camex3/proc_status.html
 5. Radiance Product Quicklooks
URL: http://cimss.ssec.wisc.edu/nast/camex3/camex3_index.html
- Comparison of spectra from NAST-I, AERI, & SHIS over Andros Island during CAMEX-3.
 1. Comparison of SHIS and NAST-I data during CAMEX-3
URL: http://arm1.ssec.wisc.edu/~shis/Results/980913_NASTcomp/nast_comparison.html
 2. NASTI comparison with calculations from CAMEX3
URL: http://danspc.larc.nasa.gov/NAST/val_calcs2.html
 3. Comparison of Scanning HIS data with an LBLRTM calculation from CAMEX-3
URL: http://arm1.ssec.wisc.edu/~shis/Results/980913_LBLRTMcomp/shiscalc.html
 4. Validation data from Andros Island (AERI, Sondes, GPS, ...)
URL: <http://cimss.ssec.wisc.edu/camex3/camexiii.html>
- Comparison of spectra from NAST-I and SHIS during WINTEX
 1. S-HIS/NAST-I Comparison from WINTEX
URL: <http://arm1.ssec.wisc.edu/~shis/wintex/results/shisnastcomp.html>
 2. NASTI comparison with calculations from WINTEX:
 - Case Description (URL: <http://danspc.larc.nasa.gov/NAST/wintexa/wintexa.html>)
 - Comparison Summary (postscript file [Wintex_NASTI_Obscalc.ps](#))
- Papers submitted to trade journals or conferences concerning NAST-I performance.
(*click here to see the list of papers*)

Task 2

- Specific recommendations made to LaRC for the operation of NAST-I (*click here to view the recommendations*)

Task 3

- Meteorological sounding products from selected datasets as directed by the LaRC NAST-I Principal Investigator
URL: <http://its.ssec.wisc.edu/nast/retrieval/products/>
- NAST-I radiance and validation datasets provided to LaRC to assist the Integrated Program Office (IPO) in their downselect for the CrIS contractor.
URL: <http://danspc.larc.nasa.gov/NAST/>).

Task 4

- Retrieval algorithm development summary
URL: <http://its.ssec.wisc.edu/nast/retrieval/description/>
- Retrieval algorithm delivery schedule
URL: <http://its.ssec.wisc.edu/nast/retrieval/delivery/>
NOTE -- delivery made to NASA-LaRC as per P.I. request, future / ongoing work declared. No general public release of retrieval code allowed, only delivery to NASA-LaRC permitted.
- Accurate 3-D representation of NAST-I derived atmospheric parameters
URL: <http://its.ssec.wisc.edu/nast/retrieval/3-D/>

Summary

This web page represents the final report of the FY99 activities of the University of Wisconsin under contract to NASA Langley Research Center in support of the NAST-I instrument and data analysis. All required tasks were completed through the period of performance ending September 30, 1999.

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