

1. CONFERENCE TITLE AND CONFERENCE CHAIR:

SPIE San Diego 97 Conference on NASA's Earth Observing System 11 (Bill Harries)

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3. ABSTRACT/PAPER TITLE:

Techniques for Unifying Disparate Elements in an EOS Instrument's Product Generation System Development Environment.

4. ABSTRACT TEXT:

The Advanced Spaceborne Thermal Emission anti Reflect ion Radiometer (ASTER) is designed to provide a high resolution map of the Earth in both visible, near-infrared, and thermal spectral regions of the electromagnetic spectrum. The ASTER Science Team has developed several standard data product algorithms, including atmospheric correction algorithms, a temperature and emissivity separation algorithm, and others. While these are being implemented primarily in C, significant portions of the system are implemented in Sequential Query Language (SQL), because one component of the system is a large lookup table, used for atmospheric correction anti implemented using a relational database system. Unix shell scripts, and other scripting languages such as Perl are used heavily in both the operational system and in testing. In addition, the requirements and methods imposed on the development environment by

the need to integrate with the Earth observing System's Data Information System create many instances of ancillary and datafiles which contain complex information which must be correctly interpreted by ninny software and script elements of the system.

Problems of maintainability arise when system elements written in these different languages make use of the same information, as for example when the value in a field in the relational database must be interpreted consistently in both SQL scripts and by C code. Similar problems occur when the information in a datafile must be interpreted consistently by in servers] components of software. Moreover, there is little or no support in SQL or any of the scripting languages for the use of software engineering principles and methodologies - such as modularity and information hiding - taken for granted in programming languages, such as C, and their associated development environments.

In the development environment for the ASTER level 11 product generation system, techniques have been incorporated to allow automated information sharing among all system elements, and to enable the use of sound software engineering techniques in the scripting languages. This paper presents these techniques in detail.

5. KEY WORDS:

ASTER, language, Macro, SQL, C

6. BRIEF BIOGRAPHY:

Alex Murray has been at the Jet propulsion Laboratory (JPL) since 1991. He is a Software Engineer for the ASTER Product Generation System, where his responsibilities include design and implementation of the CM system and development environment, as well as implementation of scientific algorithms. Previously he worked on the ground data system for the airborne spectrometer AVIRIS. Before coming to JPL, he worked for TRW Space anti Defense company in Redondo Beach, CA, where he was engaged in software engineering efforts including kernel programming, Artificial Intelligence work, and computer security engineering. He received his B. S. and M. S. degrees in Mathematics from The Ohio State University.