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## The ALEXIS Data Processing Package: An IDL Based System

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The Array of Low Energy X-ray Imaging Sensors (ALEXIS) experiment consists of a mini-satellite containing six wide angle EUV/ultrasoft X-ray telescopes. Its purpose is to map out the sky in three narrow (~5%) bandpasses around 66, 71, and 93 eV. The 66 and 71 eV bandpasses are centered on intense Fe emission lines which are characteristic of million degree plasmas such as the one thought to produce the soft X-ray background. The 93 eV bandpass is not near any strong emission lines and is more sensitive to continuum sources. The mission will be launched on the Pegasus Air Launched Vehicle in the second half of 1992 into a 400-nautical-mile, high inclination orbit and will be controlled entirely from a small ground station located at Los Alamos. The project is a collaborative effort between Los Alamos National Laboratory, Sandia National Laboratory, and the University of California-Berkeley Space Sciences Laboratory.

The six telescopes are arranged in three pairs. As the satellite spins twice a minute they scan the entire anti-solar hemisphere. Each f/1 telescope consists of a spherical, multilayer-coated mirror with a curved, microchannel plate detector located at the prime focus. The multilayer coatings determine the bandpasses of the telescopes. The field of view of each telescope is 30 degrees with a spatial resolution of 0.5 degree, limited by spherical aberration.

The data processing requirements for ALEXIS are large. Each event in one of the six telescopes is telemetered to the ground with its time of arrival and position on the detector. This information must be folded with the aspect solution for the satellite to reconstruct the direction on the sky from which the photon came. Because of the way the six telescopes scan the sky, the effective exposure calculation is also very computationally intensive. ALEXIS may generate up to 100 megabytes of raw data per day, which are converted into a gigabyte per day of processed data.

While the processing job for ALEXIS is sizable, the programming staff is small. To maximize programming efficiency, and to make the best use of tools available in the public domain, we chose IDL as our software development platform. IDL was used from the start of instrument development through flight. We use IDL as a top-level executive for the processing tasks (replacing Unix shell scripts), as a device independent graphics engine, as a database manager, and as a final data manipulator. IDL routines spawn special purpose C programs to perform detailed telemetry deconvolution and other specialized functions.

In this poster we will discuss the use of IDL and C within the processing and archiving strategy for the ALEXIS data analysis system as implemented on a SPARCstation platform. We will also show results from our End-to-End software simulation capability as processed by our analysis codes.

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