IN-89-CR

5H95-61138

39.

RESEARCH IN EXTREME ULTRAVIOLET AND

FAR ULTRAVIOLET ASTRONOMY

NASA Grant NGR-05-003-450

Professor C. S. Bowyer, Principal Investigator

SEMI-ANNUAL STATUS REPORT

June 1, 1986 - December 31, 1986

The work on this grant included many separate projects during this period. Analysis and interpretation continued on the data generated by the flight of 27.086 in April of 1986. This work was conducted by Simon Labov, and will form the primary basis for his Ph.D. thesis. The experiment made the first spectroscopic measurements of the diffuse emission in the Extreme Ultraviolet. The flight was a success. The data is excellent, and all indications are that the final results will be significant.

Data from the successful UVX mission continued to be analyzed during this period. The UVX was a shuttle born spectrometer which operated from 600 to 1900 $angstrom$. It was launched in January, 1986 on board the space shuttle. Probable detections of highly ionized species of carbon and oxygen in the far ultraviolet would be the first observation in emission of the hot gas in the interstellar medium. The instrument made nine separate observations of different portions of the sky, so that there is a wealth of different scientific projects that can be conducted. For example, one graduate student is

currently examining theories of dust scattering in the far ultraviolet, and comparing the results to our observations.

Optical and mechanical design of the 1-meter EUV telescope, planned for launch with the large SPARTAN type type carrier, ASTRO-SPAS, continued. Fabrication of some of the elements will begin this year. This project is being developed with the cooperation of the Federal Republic of Germany, which is providing the ASTRO-SPAS carrier, and the 1-meter normal incidence mirror.

The major effort of the grant centered on the preparation for flight 27.106, scheduled to launch in September, 1986. Work which was performed during this period includes:

The skins and bulkheads for the flight were designed here at Berkeley, and fabricated at the Wallops Island flight facility. Optical, mechanical and electrical designs were completed during this period. Major components of the instrument were purchased, and others were fabricated at SSL. Almost all electrical components were assembled during this period. Theoretical work, to support the data interpretation, was carried out.

In addition, efforts continued looking forward to upcoming Black Brandt experiments. New designs for EUV spectrometers were investigated. Observations were considered that would allow a better understanding of the interstellar medium and EUV sources.

Papers published by the group during this period:

1. Calibration of a 1 meter diameter normal incidence EUV spectrometer, P. Jelinsky, M. Hurwitz, S. Labov, C. Martin, and S. Bowyer, SPIE Proc., Vol. 689, Paper No. 12, 1986.

2. Discovery of Highly Ionized Line Emission in the Far Ultraviolet, C. Martin and S. Bowyer, IN PRESS, COSPAR, 1986.

3. Berkeley EUV/FUV Shuttle Telescope: Observations of Dust Reflection in the FUV, M. Hurwitz and S. Bowyer, IN PRESS, COSPAR, 1986.

4. Spectroscopy of the Extreme Ultraviolet Background Radiation, S. Labov and S. Bowyer, IN PRESS, COSPAR, 1986.