The University of Iowa

Iowa City, Iowa 52242

Department of Physics and Astronomy

(319) 335-1686

153010

P 4

1847

August 1, 1988

Ms. Genevieve E. Wiseman
Grants Officer
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt Maryland, 20771

Dear Ms. Wiseman:

Enclosed is a copy of the final technical report for Grant NAG 5-544 *Ultraviolet Geometric Albedo of Uranus.* My apologies for being so late in submitting this report.

Sincerely yours,

John S. Neff

John S. Neff
Professor of Astronomy
Department of Physics and
Astronomy
The University of Iowa
Iowa City, IA 52242

Final Report on Ultraviolet Geometric Albedo of Uranus

Grant No. NAG5-544 with NASA/GSFC

John S. Neff
Professor of Astronomy
University of Iowa

1. The purpose of this study was to obtain ultraviolet flux measurements of Uranus before and after the January 1986 flyby past Uranus by Voyager. These measurements were used to determine absolute flux distributions in the wavelength range 1950-3200Å. This wavelength range is an important region to observe since the model atmospheres for Uranus indicate that the albedo spectrum in this region can tightly constrain the height of the photochemical haze layer.

2. Neff, Bergstralh and Baines obtained data in July of 1985 and in August of 1986 on Uranus and Neptune. These data has been completely reduced. In addition all of the long wavelength low dispersion spectra of Uranus and Neptune in the archives, except for a few taken during the commissioning stage, were also reduced and combined to obtain albedo spectra at four epochs for Uranus and two epochs for Neptune.

3. Neff reviewed all of the solar flux distributions measured in the wavelength range 1800-3200 Å with a spectral resolution similar to that of the IUE long wavelength spectrograph. He combined several of these flux distributions to obtain an adopted solar flux distribution with the same spectral resolution as the IUE spectra of the planets. The solar flux distribution was then used to compute absolute geometric albedo spectra for Uranus and Neptune.

4. The spectral resolution and signal-to-noise were such that it was possible to detect Raman scattering in the 1985 and older data sets for both Uranus and Neptune. Between the 1985 and 1986 observations we had learned to make more efficient use of IUE and were able to take many more spectra of both planets. As a consequence the signal-to-noise was much higher for the 1986 data sets. It appears that it should be possible to compare the observed Raman scattering signatures with those computed from model planetary atmospheres.

5. The ultraviolet geometric albedo spectrum sets a very tight constraint on the altitude of the stratospheric haze layer in the atmospheres of both Uranus and Neptune. We had submitted a paper to Icarus based on the 1985 and archived observations, which was accepted subject to revision. Unfortunately the revisions involved recomputation of models for the atmospheres for both planets as well as revisions to the adopted solar flux distribution. So much time has elapsed we will combine the results of 1986 measurements with the previous measurements and submit a new paper.

The University of Iowa
Iowa City, Iowa 52242

Department of Physics and Astronomy
(319) 335-1686

1847

RE: NASA/GSFC Grant No. NAG5-544

Final Report Distribution List

Original	Ms. Genevieve E. Wiseman Grants Officer, Code NASA/GSFC
3 cc:	Dr. Y. Kondo Technical Officer, Code 684 Laboratory for Astronomy and Solar Physics Space and Earth Sciences Directorate NASA/GSFC
2 cc:	NASA Scientific and Technical Information Facility P.O. Box 8757 Baltimore/Washington International Airport Maryland 21240