# NEW MEASUREMENTS OF THE FAR ULTRAVIOLET SCATTERING PROPERTIES OF INTERSTELLAR DUST

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We present an analysis of spectra of the diffuse ultraviolet background taken during shuttle flight STS-61C (January 1986). Eight regions of the sky were observed for ~ 20 minutes each, using a spectrograph designed at our lab specifically to perform measurements of the UV background. The field of view was 3.8° ×8′ with imaging along the slit to confine stellar contamination. The instrument featured a shutter mechanism to measure internal background during flight, a low-scatter holographically ruled diffraction grating, photon counting microchannel plate detectors, thorough baffling, and a crystal window to further attenuate stray light. The spectra cover the range 1400 to 1850 Å and have been binned in 50Å bands for this work. We discuss our procedure for subtracting the contribution of stars too faint to be detected as discrete sources during the observations (in general this represents a small fraction of the total intensity detected except at the longest wavelengths). We describe a radiative transfer model used to interpret the data and set confidence intervals on the relevant parameters. We find that the continuum component of the diffuse ultraviolet background arises primarily from two sources. One source is scattering of starlight by interstellar dust with an albedo of about 12% and a relatively isotropic phase function. A second source consists of about 150 photons $cm^{-2}$ $sec^{-1}$ $ster^{-1}$ $Å^{-1}$ of extragalactic light which is attenuated by the dust in our galaxy. Although emission features possibly associated with molecular $H_2$ are detected in one look direction, fluorescence of $H_2$ is not a major contributor to the diffuse UV background, at least at galactic latitudes greater than ~10°. This research has been funded by NASA Grants NASA/NGR-05-003-805 and NGT-50185.