

Table of Contents

Preface	i
Acknowledgments	iii
Table of Contents	v
1. Introduction and Executive Summary	1-1
2. Instrumentation	2-1
2.1. SUV-100 UV Spectroradiometer	2-1
2.1.1. Design, Specifications, and Installation of the SUV-100	2-1
2.1.2. Ancillary Sensors	2-5
2.1.3. Maintenance and Calibration of the SUV-100	2-6
2.1.4. Software for Instrument Operation and Data Reduction	2-8
2.2. Mobile Spectroradiometers	2-8
3. Network Sites	3-1
3.1. McMurdo, Antarctica	3-1
3.2. Palmer Station, Antarctica	3-7
3.3. Amundsen-Scott South Pole Station, Antarctica	3-12
3.4. Ushuaia, Argentina	3-16
3.5. San Diego, California, USA	3-21
3.6. Barrow, Alaska, USA	3-25
4. Spectral Measurements and Data Analysis	4-1
4.1. Types of Spectral Measurements	4-1
4.1.1. Data Scan	4-2
4.1.2. Response Scan	4-5
4.1.3. Internal Wavelength Scan	4-5
4.1.4. External Wavelength Scan	4-7
4.1.5. Absolute Scan	4-8
4.2. Calibration and Data Processing	4-9
4.2.1. Irradiance Calibration	4-9
4.2.2. Wavelength Calibration and Correction	4-15
4.2.3. Biological Dose-Rate Calculations	4-24
4.2.4. Calculation of Solar Zenith and Azimuth Angles	4-26
5. Quality Control and Calibration Standards	5-1
5.1. McMurdo Station (1/19/98 – 1/19/99)	5-8
5.1.1. Irradiance Calibration	5-8
5.1.2. Instrument Stability	5-10
5.1.3. Wavelength Calibration	5-12
5.1.4. Missing Data	5-15
5.2. Palmer Station (4/6/98 – 5/2/99)	5-16
5.2.1. Irradiance Calibration	5-16
5.2.2. Instrument Stability	5-18
5.2.3. Wavelength Calibration	5-20
5.2.4. Missing Data	5-23

5.3. Amundsen-Scott South Pole Station (1/10/98–1/11/99)	5-24
5.3.1. Irradiance Calibration	5-24
5.3.2. Instrument Stability	5-26
5.3.3. Wavelength Calibration	5-28
5.3.4. Missing Data	5-31
5.4. Ushuaia, Argentina (4/20/98– 8/24/99)	5-32
5.4.1. Irradiance Calibration	5-32
5.4.2. Instrument Stability	5-35
5.4.3. Wavelength Calibration	5-38
5.4.4. Missing Data	5-41
5.5. San Diego (10/2/98 – 9/19/99)	5-42
5.5.1. Irradiance Calibration	5-42
5.5.2. Instrument Stability	5-44
5.5.3. Wavelength Calibration	5-46
5.5.4. Missing Data	5-49
5.6. Barrow, Alaska (8/28/98 – 11/4/99)	5-50
5.6.1. Irradiance Calibration	5-50
5.6.2. Instrument Stability	5-51
5.6.3. Wavelength Calibration	5-54
5.6.4. Missing Data	5-57
6. Description of Published Data.....	6-1
6.1. Overview.....	6-1
6.2. Contents of Databases.....	6-2
6.2.1. Database 1: Instrument Parameters during Solar Scans	6-2
6.2.2. Database 2: Solar Spectral Irradiance at Selected Wavelengths	6-3
6.2.3. Database 3: Spectral Integrals and Dose Weightings	6-5
6.2.4. Database 4: General Interest (Short Form)	6-6
6.2.5. Database 5: Instrument Parameters during Response Scans	6-7
6.2.6. Glossary of Database Notation	6-8
6.3. Format of Solar Irradiance Spectra Files	6-9
6.4. Ozone Data	6-11
6.5. Weather Data	6-12
6.6. CD-ROM Contents.....	6-13
7. Examples of Network Data.....	7-1
7.1. McMurdo Station.....	7-2
7.2. Palmer Station.....	7-8
7.3. Amundsen-Scott South Pole Station	7-14
7.4. Ushuaia, Argentina	7-20
7.5. San Diego, California	7-26
7.6. Barrow, Alaska	7-31
7.7. Differences Between Sites	7-37
7.8. Are there UV Irradiance Trends?.....	7-42
7.9. Factors affecting UV Radiation	7-44
7.10. Amplification of UV Radiation Correlated with Ozone Depletion	7-47
Appendices.....	A-1
A.1. Errata	A-3
A.2. References	A-7
A.3. Code Fragments for Integrations and Dose Weightings	A-16