

## Table of Contents

Preface.....	i
Acknowledgments.....	iii
Table of Contents.....	v
<b>1. Introduction and Executive Summary.....</b>	<b>1-1</b>
<b>2. Instrumentation.....</b>	<b>2-1</b>
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. Operation, 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
<b>3. Network Sites.....</b>	<b>3-1</b>
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
<b>4. Spectral Measurements and Data Analysis .....</b>	<b>4-1</b>
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 Daily Doses.....	4-26
4.2.5. Calculation of Solar Zenith and Azimuth Angles .....	4-27
<b>5. Quality Control and Calibration Standards .....</b>	<b>5-1</b>
5.1. McMurdo Station (1/19/98 – 1/19/99) .....	5-12
5.1.1. Irradiance Calibration.....	5-12
5.1.2. Instrument Stability .....	5-14
5.1.3. Wavelength Calibration.....	5-16
5.1.4. Missing Data .....	5-19
5.2. Palmer Station (4/6/98 – 5/2/99).....	5-20
5.2.1. Irradiance Calibration.....	5-20
5.2.2. Instrument Stability .....	5-22
5.2.3. Wavelength Calibration.....	5-24
5.2.4. Missing Data .....	5-29

5.3. Amundsen-Scott South Pole Station (1/10/98–1/11/99).....	5-30
5.3.1. Irradiance Calibration.....	5-30
5.3.2. Instrument Stability.....	5-32
5.3.3. Wavelength Calibration.....	5-34
5.3.4. Missing Data.....	5-35
5.4. Ushuaia, Argentina (4/20/98– 8/24/99).....	5-37
5.4.1. Irradiance Calibration.....	5-38
5.4.2. Instrument Stability.....	5-40
5.4.3. Wavelength Calibration.....	5-44
5.4.4. Missing Data.....	5-48
5.5. San Diego (10/2/98 – 9/19/99).....	5-49
5.5.1. Irradiance Calibration.....	5-49
5.5.2. Instrument Stability.....	5-54
5.5.3. Wavelength Calibration.....	5-57
5.5.4. Missing Data.....	5-60
5.6. Barrow, Alaska (8/28/98 – 11/4/99).....	5-61
5.6.1. Irradiance Calibration.....	5-61
5.6.2. Instrument Stability.....	5-63
5.6.3. Wavelength Calibration.....	5-66
5.6.4. Missing Data.....	5-69
<b>6. Description of Published Data.....</b>	<b>6-1</b>
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. Daily Dose Database.....	6-8
6.2.7. Glossary of Database Notation.....	6-9
6.3. Format of Solar Irradiance Spectra Files.....	6-11
6.4. Ozone Data.....	6-13
6.5. Weather Data.....	6-14
6.6. CD-ROM Contents.....	6-14
<b>7. Examples of Network Data.....</b>	<b>7-1</b>
7.1. McMurdo Station.....	7-2
7.2. Palmer Station.....	7-6
7.3. Amundsen-Scott South Pole Station.....	7-10
7.4. Ushuaia, Argentina.....	7-14
7.5. San Diego, California.....	7-18
7.6. Barrow, Alaska.....	7-22
7.7. Differences Between Sites.....	7-27
7.8. Trends in UV.....	7-32
7.9. Factors Affecting UV Radiation.....	7-34
7.10. Relationship Between Total Column Ozone and UV.....	7-37
<b>Appendices.....</b>	<b>A-1</b>
A.1. Errata.....	A-3
A.2. References.....	A-7
A.3. Code Fragments for Integrations and Dose Weightings.....	A-17