

Contents

Page

<i>Preface</i>	ix
<i>Acknowledgments from the Authors</i>	xi
CHAPTER 1. INTRODUCTION	1
CHAPTER 2. BACKGROUND	5
CHAPTER 3. SOLAR AUREOLE OBSERVATION AND ALMUCANTAR SCAN RADIANCE	21
3-1. Solar Aureole Observation	21
3-2. Formulation for Almuquantar Scan Radiance	25
3-2-1. Sensor Viewing Path	25
3-2-2. Direct Sunlight Path of Sensor Viewing Path Scattering Elements	31
3-2-3. Total Volume Scattering Intensity Function (VSIF) of Scattering Elements	39
3-2-4. Solar Aureole Almuquantar Scan Radiance	41
3-3. Almuquantar Scan Radiance Analysis	41
3-4. Solar Aureole Photograph Simulation	51
3-5. Aureole Photograph Simulation Results	59
3-6. Almuquantar Scan Track in Solar Aureole Photograph	64
3-7. Aerosol Properties Retrieval from Almuquantar Scan Radiance	69
CHAPTER 4. CONSTANT-ALTITUDE MULTI-ANGLE ATMOSPHERIC LIMB SCATTERING SYSTEM	79
4-1. Solar Occultation Observation and Atmospheric Limb Optical Depth ...	80
4-2. Constant-Altitude Multi-Angle Limb Scattering System	84
4-3. Characteristics of Constant-Altitude Multi-Angle Atmospheric Limb Scattering System	88

4-4. Solar Aureole Constant-Altitude Multi-angle Atmospheric Limb Scattering Radiance.....	96
4-5. Satellite Solar Aureole Photograph Simulation.....	99
CHAPTER 5. AEROSOL PROPERTIES RETRIEVAL FROM ATMOSPHERIC LIMB SCATTERING RADIANCE	105
5-1. Information Content of Aerosol Scattering Radiance	105
5-2. Atmospheric Extinction Profile Retrieval	107
5-3. Aerosol Volume Scattering Intensity Function (VSIF) Profile Retrieval	112
5-4. Aerosol Size Distribution and Refractive Index Retrieval	117
CHAPTER 6. TOTAL SOLAR ECLIPSE SUNLIGHT DOUBLE SCATTERING AND CLEAR SKY MULTIPLE SCATTERING	128
6-1. Model Description.....	128
6-2. Total Solar Eclipse Sunlight Double Scattering Analysis	130
CHAPTER 7. HIGHLIGHTS AND REMARKS	143
APPENDIX: GLOSSARY OF PRINCIPAL SYMBOLS.....	146
AUTHOR INDEX	149
SUBJECT INDEX.....	151