629.4 KRE

CONTENT

| 1. | Introduction 1-1 Fundamentals of Thermal Rediation 1-2 Absorption, Reflection, and Transmission 1-3 Kirchhoff's Law and the Black Body References | 1 3 7 8 13 |
|----|--|---|
| 2. | Determination of Radiation Properties 2-1 Evaluation of Effective Properties from Spectral Data 2-2 Application of Radiation Tables 2-3 Experimental Methods for Measuring Radiation Properties References | 15 15 18 31 38 |
| 3. | Analysis of Radiation Heat Transfer 3-1 Basic Equations 3-2 Network Method 3-3 Solution by Determinants References | 40 40 44 50 55 |
| 4. | Solar, Terrestrial, and Planetary Radiation 4-1 Solar Radiation 4-2 Celestial and Terrestrial Coordinates 4-3 Terrestrial and Atmospheric Radiation 4-4 Planetary Radiation References | 57 57 64 71 74 78 |
| 5. | Temperature control of Satellites and Space Vehicles 5-1 Heat-Balance Equations 5-2 Methods of Temperature Control 5-3 Magnitude of Temperature Control 5-4 Examples of earth Satellites 5-5 Approximate Orbit Analysis 5-6 Interplanetary Vehicles References | 80 80 82 84 86 95 99 102 |
| 6. | Solar Power Plant for Space Vehicles 6-1 Optimization Analysis for Spaceborne Solar Power Plants 6-2 Solar Radiation Collectors 6-3 Design of Cavity-Type Absorbers 6-4 Space Radiator Analysis 6-5 Solar Power Plant analysis References | 103 105 108 117 122 129 133 |
| 7. | Direct Solar Energy Conversion Systems 7-1 Types of Direct Energy Converters 7-2 Solar Thermoelectric Converters 7-3 Photovoltaic Solar Cell 7-4 Solar Thermionic Converter 7-5 Solar Regenerative Fuel Cell 7-6 Comparison of Space Power Systems 7-7 Solar Propulsion Possibilities References | 136 136 138 147 163 168 173 176 179 |

| Appendices | | | 183 |
|------------|-----|---|-----|
| | Ι | Nomenclature | 185 |
| | II | Physical Constants and Conversion Factors | 188 |
| | III | A Simple mechanical Integrator for the Determination of Geometrical Shape Factors | 189 |
| | IV | Method for Calculating the Concentrated Solar Energy Flux Pattern | 193 |
| | V | Shape-Factor Evaluation | 201 |
| т 1 | | | 001 |
| Index | | | 231 |