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Nota di contenuto	Cover; Contents; Preface; Acknowledgments; Definitions; Chapter 1 Inversion of Elastic-Lidar Data as an ILL-Posed Problem; 1.1 Recording and Initial Processing of the Lidar Signal: Essentials and~Specifics; 1.1.1 Lidar Equation and Real Lidar Signal: How Well Do They Match?; 1.1.2 Multiplicative and Additive Distortions in the Lidar Signal: Essentials and Specifics; 1.2 Algorithms for Extraction of the Extinction-Coefficient Profile from the Elastic-Lidar Signal; 1.2.1 Basics; 1.2.2 Fernald's Boundary-Point Solution; 1.2.3 Optical Depth Solution 1.2.4 Implicit Premises and Mandatory Assumptions Required for~Inversion of the Elastic Lidar Signal into the Atmospheric Profile1.3 Profiling of the Optical Parameters of the Atmosphere as a Simulation Based on Past Observations; 1.3.1 Definitions of the Terms; 1.3.2 Random Systematic Errors in the Derived Atmospheric Profiles: Origin and Examples; 1.4 Error Factor in Lidar Data Inversion; 1.5 Backscatter Signal Distortions and Corresponding Errors in the Inverted Atmospheric Profiles; 1.6 Determination of the Constant Offset in the Recorded Lidar Signal Using~the Slope Method 1.6.1 Algorithm and Solution Uncertainty1.6.2 Numerical Simulations and Experimental Data; 1.7 Examination of the Remaining Offset in the

Backscatter Signal by~Analyzing the Shape of the Integrated Signal; 1.8 Issues in the Examination of the Lidar Overlap Function; 1.8.1 Influence of Distortions in the Lidar Signal when Determining the~Overlap Function; 1.8.2 Issues of Lidar Signal Inversion within the Incomplete Overlap Area; Chapter 2 Essentials and Issues in Separating the Backscatter and Transmission Terms in The Lidar Equation
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2.1.1 Inversion Algorithm for the Signals of Raman Lidar; 2.1.2 Inversion Algorithm for the Signals of High Spectral Resolution Lidar (HSRL); 2.1.3 Inversion Algorithm for Signals of the Differential Absorption Lidar (DIAL); 2.2 Distortions in the Optical Depth and Extinction-Coefficient Profiles Derived from Raman Lidar Data; 2.2.1 Distortion of the Derived Extinction Coefficient Due to Uncertainty of the Angstrom Exponent
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Sommario/riassunto

Provides tools and techniques to identify and address distortions and to interpret data coming from Lidar sensing technology This book covers the issues encountered in separating the backscatter and transmission terms in the LIDAR equation when profiling the atmosphere with zenith-directed and vertically-scanning Lidars. Solutions in Lidar Profiling of the Atmosphere explains how to manage and interpret the Lidar signals when the uncertainties of the involved atmospheric parameters are not treatable statistically. The author discusses specific scenarios for using specific scenarios for p
