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	Coded Signal; 2.4.5 The Effect of Doppler on a Phase Coded Signal; 2.4.6 Comparison of an LFM Signal with a Phase Coded Signal; 2.5 Stepped-Frequency Pulse Signal and its Processing; 2.5.1 Stepped- Frequency (Hop-Frequency) Pulse Signal; 2.5.2 FM Stepped Pulse Signal; 2.5.3 Stepped-Frequency Waveform Synthesis Processing; 2.6 Orthogonal Waveform; 2.6.1 The Orthogonal Waveform; 2.6.2 Orthogonal Binary Phase Coded Sequence Design Based on the Genetic Algorithm; 2.7 MATLAB® Program List; References; Chapter 3 System Design of SIAR 3.1 Introduction3.2 Principles of SIAR; 3.2.1 Orthogonal Frequency- Coded Signals; 3.2.2 Concepts of Impulse Synthesis and Aperture Synthesis; 3.2.3 Spatial-Temporal 3D Matched Filtering; 3.2.4 Synthesis of the Transmit Beam; 3.3 Synthesis of Transmit Pulse and Aperture; 3.3.1 Wideband Signal Model of SIAR; 3.3.2 Impulse Synthesis in Time and Frequency Domains; 3.3.3 Impulse Synthesis in the Time Domain; 3.3.4 Impulse Synthesis in the Frequency Domain; 3.3.5 Sampling Loss and its Compensation; 3.4 4D Ambiguity Function of SIAR; 3.4.1 Ambiguity Function of a Common Radar 3.4.2 4D Ambiguity Function of SIAR and its Characteristics; 3.5.1 SIAR Radar Equation and Phased Array Radar Equation; 3.5.2 Energy Utilization Ratio of SIAR; 3.5.3 LPI Performance of SIAR; 3.5.4 Compare SIAR with PAR; 3.6 Experimental System of SIAR; 3.6.1 Antenna Subsystem; 3.6.2 Transmitting Subsystem; 3.6.3 Receiving Subsystem; 3.6.4 Frequency Synthesis Subsystem; 3.7 Gain and Phase Calibration of SIAR; 3.8 Experimental Results of SIAR; 3.9 SIAR with Large Random Sparse Array; 3.10 Brief Summary 3.11 MATLAB® Program List
Sommario/riassunto	Analyzes and discusses the operating principle, signal processing method, and experimental results of this advanced radar technology This book systematically discusses the operating principle, signal processing method, target measurement technology, and experimental results of a new kind of radar called synthetic impulse and aperture radar (SIAR). The purpose is to help readers acquire an insight into the concept and principle of the SIAR, to know its operation mode, signal processing method, the difference between the traditional radar and itself, the designing ideals, and the developing me