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ON OPTICAL INTERFEROMETRY; 4.4.1 IFM Based on Noncoherent Optical Delays; 4.4.2 IFM Based on Coherent Optical Delays; 4.5 IFM BASED ON POLARIZATION EFFECTS; 4.5.1 IFM Based on Measurement of Stokes Parameters; 4.5.2 IFM Based on Polarization Interferometers; 4.5.3 IFM Based on Polarization Modulator and Polarization Adjustments; 4.5.4 IFM Based on Polarization Modulators and Modulation Bias Adjustments; 4.5.5 IFM Based on Polarization Modulator and Dispersion. 4.5.6 IFM Based on Polarization Microwave Photonic Filter Pairs 4.6 IFM BASED ON OPTICAL FILTERING; 4.6.1 IFM Based on Mach-Zehnder Interferometer Optical Filters; 4.6.2 IFM Based on Ring-resonator Optical Filters; 4.6.3 IFM Based on the Bragg Grating Optical Filters; 4.7 IFM BASED ON FREQUENCY TO TIME MAPPING; 4.7.1 Single RF Signal Measurement; 4.7.2 Multiple RF Signal Measurement; 4.8 IFM BASED ON OPTICAL MIXING; 4.8.1 IFM Based on Optoelectrical Mixing; 4.8.2 IFM Based on All Optical Mixing; 4.9 IFM BASED ON STIMULATED BRILLOUIN SCATTERING. 4.9.1 Stimulated Brillouin Scattering in Optical Fibers 4.9.2 IFM Based on SBS Resonance Shift; 4.9.3 IFM Based on SBS Resonance and Channelizing Probe Array; 4.9.4 IFM Based on SBS Resonance Channelizers; 4.10 OTHER PHOTONIC IFM APPROACHES; 4.10.1 IFM Based on Microwave Photonic Filters; 4.10.2 IFM Based on Quadrature Optical Filter Pairs; 4.10.3 IFM Based on a Bank of Offset Optical Filters; 4.10.4 IFM Based on Phase to Intensity Modulation Conversions; 4.10.5 IFM Based on Photonic Assisted Samplings and Downconversions; 4.11 DISCUSSION; 4.12 CONCLUSION; References; About the Authors; Index.

Sommario/riassunto

This unique first-of-its-kind resource provides practical coverage of the design and implementation of frequency measurement receivers, which aid in identifying unknown signals. The technologies used in frequency measurement interferometry-based on-delay lines and filters are explored in this book. Practitioners also find concrete examples of microwave photonics implementations. The designs and concepts that cover conventional photonic instantaneous frequency measurement (IFM) circuits are explained. This book provides details on new designs for microwave photonic circuits and reconfigurable frequency measurement (RFM) circuits using diodes and MicroElectroMechanical Systems (MEMS). This book explains the many diverse applications of frequency measurement that are used in defense, radar, and communications. The instrumentation used to perform frequency measurements is explained, including the use of block analysis for network and spectrum analyzers and calibration techniques. Readers learn the advantages of using frequency measurement based on microwave/RF techniques, including immunity to electromagnetic interference, low loss, compatibility with fiber signal distribution, and parallel processing signals. Moreover, readers gain insight into the future of frequency measurement receivers. The book examines both the underpinnings and the implementation of frequency measurement receivers using many diverse technological platforms.