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2.12.2 LOB Error; 2.12.3 Effects of Bias on Bearing-Only PF; 2.12.4 Combining Noisy LOB Measurements; 2.12.5 Effects of Navigation Error; 2.13 Concluding Remarks; References; Appendix 2A Least-Squares Error Estimation Program Listing; Appendix 2B Generalized Bearing Program Listing; Chapter 3 DF Techniques; 3.1 Introduction; 3.2 Array Processing Direction of Arrival Measurement Methods; 3.2.1 Introduction; 3.2.3 Array Covariance Modeling; 3.2.4 Direction of Arrival; 3.2.5 Subspace-Based Methods; 3.2.6 Beamforming AOA Estimation; 3.2.7 Maximum Likelihood AOA Estimation; 3.2.8 Least-Squares Error AOA Estimation; 3.2.9 Decoupling Sample Source Signals from AOA Parameters; 3.2.10 Gram-Schmidt Orthogonalization; 3.2.11 Nonlinear Programming; 3.3 Other Methods of Estimating the AOA; 3.3.1 Phase Interferometry; 3.3.2 Amplitude Systems; 3.3.3 Doppler Direction Finder; 3.4 MSE Phase Interferometer; 3.4.1 Introduction; 3.4.2 The Algorithm; 3.4.3 Simulation; 3.5 DF with a Butler Matrix; 3.5.1 Introduction; 3.5.2 Beamforming Network; 3.6 Phase Difference Estimation Using SAW Devices; 3.6.1 Introduction; 3.6.2 SAW Characteristics; 3.7 Concluding Remarks; References. Chapter 4 MUSIC; 4.1 Introduction; 4.2 MUSIC Overview; 4.3 MUSIC; 4.3.1 The MUSIC Algorithm; 4.4 Performance of MUSIC in the Presence of Modeling Errors; 4.4.1 Model Errors; 4.4.2 Error Expressions; 4.4.3 Results; 4.5 Determining the Number of Wavefields; 4.6 Effect of Phase Errors on the Accuracy of MUSIC; 4.6.1 Introduction; 4.6.2 Accuracy; 4.6.3 Solutions for Errors; 4.6.4 Statistics; 4.6.5 Horizontal Planar Arrays; 4.6.6 Simulations; 4.6.7 Summary; 4.7 Other Superresolution Algorithms; 4.7.1 Maximum Likelihood Method; 4.7.2 Adaptive Angular Response; 4.7.3 Thermal Noise Algorithm.

Sommario/riassunto

Worldwide growth of space communications has caused a rapid increase in the number of satellites operating in geostationary orbits, causing overcrowded orbits. This practical resource is designed to help professionals overcome this problem. This timely book provides a solid understanding of the use of radio interferometers for tracking and monitoring satellites in overcrowded environments. Practitioners learn the fundamentals of radio interferometer hardware, including antennas, receiving equipment, signal processing and phase detection, and measurement accuracies. This in-depth volume describes the nature of the targets to be tracked by the interferometer, helping to clarify the movement of target satellites and what specific information has to be caught by the interferometer. Additionally, engineers find details on applications to practical cases of satellite tracking, covering different types of interferometers, recent technical developments, orbital monitoring and safety control.
