Contents

Part I Satellite Navigation Signal System, Compatibility and Interoperability

1	The Research of the High-Altitude BDS Weak Signal Acquisition	3
2	GNSS Message Structure Optimization	15
3	Interlacing Dual-Sideband Enhanced Alternative BOC (IDEAl-BOC) Modulation and Its Application for GNSS Tao Yan, Jiaolong Wei, Zuping Tang, Bo Qu and Zhihui Zhou	25
4	CBFH: Coherent Binary Frequency-Hopping Multiplexing	
	for BeiDou B2 Signal	37
5	Navigation Signal Acquisition Method Based on Multiple	47
	DBZP Fusion	47
6	Weak Signal Acquisition Performance for Different Pilot	
	Channel Design Options	59
7	Tracking and Multipath Performance Analysis of the MBOC Approximation by BOC Modulation in Band-Limited Receiver Channels	71
	Xinhui Lin, Feng Liu, Yiqing Zhang and Lei Zhang	
8	A Proposed Selection and Allocation of Spread-Spectrum Code for Compass B1C Signal	81

9	The Performance of Interferometric Ranging Systems with Hopping Frequencies in Benign Environment and Under Partial-Band Jamming	93
10	Optimized Asymmetric Dual-Frequency Constant Envelope Multiplexing Technique	103
11	Performance Evaluation of Interoperable Signals on B2 Band Su Chengeng, Tang Zuping and Meng Yinan	115
12	PRIS: A Novel Complex Sequence Construction Method Zuping Tang, Jiaolong Wei, Hongwei Zhou, Tao Yan, Zhihui Zhou and Bo Qu	133
Par	t II Satellite Navigation Augmentation and Integrity Monitoring	
13	Application of Neural Network Aided Particle Filter in GPS Receiver Autonomous Integrity Monitoring Ershen Wang, Tao Pang, Ming Cai and Zhixian Zhang	147
14	Receiver Autonomous Integrity Monitoring for Fixed Ambiguity Precise Point Positioning	159
15	Deformation Characteristics of COMPASS Satellite Signals Jiancheng Liu, Huafeng Yang, Jianjun Fan and Dawei Zhu'	171
16	Modeling and Application of COMPASS Satellite Orbits and Clocks Predicted Correction	181
17	Design and Evaluation of Wide Area Augmentation Navigation Message	193
18	Validation of GNSS ARAIM Algorithm Using Real Data Bin Li, Jizhang Sang and Yun Wu	203

Par	t III Satellite Navigation Models and Methods	
19	Real-Time and Fast Retrieve the Coseismic Wave by GPS, Strong-Motion Combined Measurements and Broadcast Ephemeris	217
20	Effect of Separation of Navigation Satellite Antenna Inter-Frequency Phase Centers on $T_{\rm GD}$ Parameter Jiaxing Liu, Shaojun Bi, Jinjun Zheng and Jun Xie	227
21	Application of Independently Estimated DCB and Ionospheric TEC in Single-Frequency PPP	239
22	A New Strategy on Precise Clock Combination of IGS Analysis Centers	255
23	GNSS Dynamic PPP Based on Additional Priori Coordinate and Epoch Constraints Information	269
24	Model and Data Driven Partial Ambiguity Resolution for Multi-Constellation GNSS	285
25	Prediction of Polar Motion Based on Combination of Weighted Least-Squares and Autoregressive Moving Average	303
26	Ambiguity Acceptance Testing: A Comparison of the Ratio Test and Difference Test	313
27	A Multi-Step Multi-Order Numerical Difference Method for Traveling Ionospheric Disturbances Detection Long Tang and Xiaohong Zhang	331

28	Vertical Displacement Parameters Based on GPS PPP and Harmonic Analysis Method	341
29	Estimate DCB of BDS Satellites Based on the Observations of GPS/BDS	351
30	Regional Ionospheric TEC Gradients Estimation Using a Single GNSS Receiver	363
31	A Inter Satellite Link Algorithm of Satellite Navigation System Based on the Integration	375
32	Ill-Posedness Analysis of Ambiguity Resolution Using BDS-2 and Its Fusion with GPS Wang Gao, Chengfa Gao, Shuguo Pan, Shengli Wang and Xiaofei Shi	387
33	Extraction and Application of Un-differenced Atmospheric Delays with Un-combined Precise Point Positioning Technique Denghui Wang, Chengfa Gao, Shuguo Pan, Yang Yang and Shengli Wang	399
34	Latest GNSS Results of the CMONOC Network and Its Application in Earthquake Monitoring	415
35	A Study of Analytical Solar Radiation Pressure Modeling for BeiDou Navigation Satellites Based on RayTracing Method	425

Contents xvii

36	Integration of GNSS and Seismic Data for Earthquake Early Warning: A Case Study on the 2011 Mw 9.0	
	Tohoku-Oki Earthquake	437
	Bofeng Guo, Xiaohong Zhang and Xingxing Li	
37	Assessment of GPT2 Empirical Troposphere Model and Application Analysis in Precise Point Positioning	451
38	Comparison of IRI-2012 and Rapid GIMs With GNSS-Derived TEC Over China	465
39	Mitigation of Ionospheric Delay in GPS/BDS Single Frequency PPP: Assessment and Application Zishen Li, Lei Fan, Yunbin Yuan, Sandra Verhagen, Peter de Bakker, Hong Yuan and Shiming Zhong	477