True Time Delay in Phased Arrays

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Citation Report

#	Article	IF	Citations
1	ANALYTICAL AND NUMERICAL EVALUATIONS OF FLEXIBLE V-BAND ROTMAN LENS BEAMFORMING NETWORK PERFORMANCE FOR CONFORMAL WIRELESS SUBSYSTEMS. Progress in Electromagnetics Research B, 2016, 71, 77-89.	0.7	7
2	RF array system equalization and true time delay with FPGA hardware-in-the-loop. , 2016, , .		7
3	Wideband delay-sum digital aperture using Thiran all-pass fractional delay filters. , 2016, , .		2
4	Rotman Lens Based Hybrid Analogâ€“Digital Beamforming in Massive MIMO Systems: Array Architectures, Beam Selection Algorithms and Experiments. IEEE Transactions on Vehicular Technology, 2017, 66, 9134-9148.	3.9	62
5	Optically Powered and Controlled Beam Steering System for Radio-Over-Fiber Networks. Journal of Lightwave Technology, 2017, 35, 979-988.	2.7	39
6	Analysis of Photonics-Based RF Beamforming With Large Instantaneous Bandwidth. Journal of Lightwave Technology, 2017, 35, 5010-5019.	2.7	12
7	A true-time-delay transmit/receive module for X-band subarray phased arrays. IEICE Electronics Express, 2017, 14, 20171039-20171039.	0.3	2
8	Microcomb-Based True-Time-Delay Network for Microwave Beamforming With Arbitrary Beam Pattern Control. Journal of Lightwave Technology, 2018, 36, 2312-2321.	2.7	68
9	Rotman lens-based two-tier hybrid beamforming for wideband mmWave MIMO-OFDM system with beam squint. Eurasip Journal on Wireless Communications and Networking, 2018, 2018, .	1.5	10
10	Frequency-Quadrupled Microwave Signal Generation with Tunable Phase Shift Employing No Optical Filter. , 2018, , .		0
11	Beyond the Bode-Fano Bound: Wideband Impedance Matching for Short Pulses Using Temporal Switching of Transmission-Line Parameters. Physical Review Letters, 2018, 121, 204301.	2.9	92
12	Integrated On-Chip Bragg Time-Delay System for Thermo-Optical Control of a Microwave Antenna. Journal of Lightwave Technology, 2018, 36, 5849-5856.	2.7	3
13	Configurable Photonic True-Time Delay Line Based On Cascaded Linearly Chirped Fiber Bragg Grating. , 2018, , .		4
14	Real-Time Spectrum Sniffer for Cognitive Radio Based on Rotman Lens Spectrum Decomposer. IEEE Access, 2018, 6, 52366-52373.	2.6	7
15	Time-to-Space Division Multiplexing for Tb/s Mobile Cells. IEEE Transactions on Wireless Communications, 2018, 17, 4806-4818.	6.1	6
16	Flexible-Resolution, Arbitrary-Input, and Tunable Rotman Lens Spectrum Decomposer. IEEE Transactions on Antennas and Propagation, 2018, 66, 3936-3947.	3.1	8
17	Digital beamforming for ultraâ€wideband signals utilizing an extrapolated array generated by CarathÃ©odory representation combining fractional delay filters based on highâ€order Hermite interpolation. IEEJ Transactions on Electrical and Electronic Engineering, 2018, 13, 1760-1768.	0.8	3
18	Real-Time 2-D FIR Trapezoidal Digital Filters for 2.4 GHz Aperture Receiver Applications. , 2018, , .		6

#	Article	IF	Citations
19	Monolithic IPD-MEMS Technology and Its Applications to High-<inline-formula> <tex-math notation="LaTeX">Q </tex-math> </inline-formula> Switched Capacitor Banks and Variable True-Time-Delay Networks. IEEE Transactions on Components, Packaging and Manufacturing Technology, 2018, 8, 1327-1335.	1.4	2
20	Enhanced Optical Delay Line in Few-Mode Fiber Based on Mode Conversion Using Few-Mode Fiber Bragg Gratings. IEEE Journal of Quantum Electronics, 2018, 54, 1-7.	1.0	3
21	A True Time Delay 16-Element 4-Beam Digital Beamformer. , 2018, , .		9
22	An Integrated Discrete-Time Delay-Compensating Technique for Large-Array Beamformers. IEEE Transactions on Circuits and Systems I: Regular Papers, 2019, 66, 3296-3306.	3.5	44
23	Photonics-Based High-Resolution 3D Inverse Synthetic Aperture Radar Imaging. IEEE Access, 2019, 7, 79503-79509.	2.6	27
24	Bias Correction to Antenna Frequency Response for Wideband Polarimetric Phased Array Radar. Electronics (Switzerland), 2019, 8, 1075.	1.8	4
25	Compensation Method for a Wideband Signalâ€™s Squint Problem of an AESA SAR System Using a Cross-Range-Variant Antenna Gain Equalizer. IEEE Sensors Journal, 2019, 19, 2937-2945.	2.4	4
26	Ka-Band Inductor-Shared SP${n}$ T DP${n}$ T Switches and Their Applications to TTD Phase Shifter. IEEE Transactions on Microwave Theory and Techniques, 2019, 67, 2546-2554.	2.9	17
27	Design and Optimization of a Coherent Beamforming Network for an Aperiodic Concentric Ring Array. International Journal of Antennas and Propagation, 2019, 2019, 1-10.	0.7	4
28	Optimum Wideband High Gain Analog Beamforming Network for 5G Applications. IEEE Access, 2019, 7, 52226-52237.	2.6	20
29	Continuous True-Time Delay Phase Shifter Using Distributed Inductive and Capacitive Miller Effect. IEEE Transactions on Microwave Theory and Techniques, 2019, 67, 3053-3063.	2.9	17
30	A 1-GHz 16-Element Four-Beam True-Time-Delay Digital Beamformer. IEEE Journal of Solid-State Circuits, 2019, 54, 1304-1314.	3.5	41
31	Wideband Direction of Arrival Estimation using Monopulse in Rotman Lens Beamspace. , 2019, , .		2
32	Ka-band 5-bit TTD Phase Shifter with Miniaturized Equivalent Delay Lines. , 2019, , .		1
33	Factors that Define the Bandwidth of a Phased Array Antenna. , 2019, , .		2
34	A 48â€“79 GHz Low-Noise Amplifier with Broadband Phase-Invariant Gain Control in 45nm SOI CMOS. , 2019, , .		3
35	A Noncoherent Massive MIMO System Employing Beamspace Techniques. IEEE Transactions on Vehicular Technology, 2019, 68, 11052-11063.	3.9	3
36	Wideband Millimeter-Wave Beam Training with True-Time-Delay Array Architecture. , 2019, , .		20

#	Article	IF	Citations
37	The More (Antennas), the Merrier: A Survey of Silicon-Based mm-Wave Phased Arrays Using Multi-IC Scaling. IEEE Microwave Magazine, 2019, 20, 32-50.	0.7	95
38	Radio-Frequency Signal Processing Using Optical Frequency Combs. IEEE Photonics Technology Letters, 2019, 31, 1874-1877.	1.3	10
39	Continuously Tunable True-Time-Delay Phase Shifter Based on Transmission Lines With Simultaneously Reconfigurable Impedance and Phase Constant. IEEE Transactions on Microwave Theory and Techniques, 2019, 67, 4714-4723.	2.9	22
40	High Resolution FDMA MIMO Radar. IEEE Transactions on Aerospace and Electronic Systems, 2020, 56, 2806-2822.	2.6	22
41	Group Delay-Based Wideband Photonic Receive-Mode Radio-Frequency Beamforming. Journal of Lightwave Technology, 2020, 38, 5893-5907.	2.7	0
42	A 0.6â€“4.0 GHz RF-Resampling Beamforming Receiver With Frequency-Scaling True-Time-Delays up to Three Carrier Cycles. IEEE Solid-State Circuits Letters, 2020, 3, 234-237.	1.3	11
43	Combined CS and DL techniques for DOA with a Rotman Lens. , 2020, , .		1
44	Broadband 110 - 170 GHz True Time Delay Circuit in a 130-nm SiGe BiCMOS Technology. , 2020, , .		17
45	Design Considerations and FPGA Implementation of a Wideband All-Digital Transmit Beamformer with 50% Fractional Bandwidth. , 2020, , .		2
46	Miniaturized 4 Ã— 4 Butler Matrix and Tunable Phase Shifter Using Ridged Half-Mode Substrate Integrated Waveguide. IEEE Transactions on Microwave Theory and Techniques, 2020, 68, 3379-3388.	2.9	33
47	Bipolar photoresponse ultraviolet photodetectors based on ZnO nanowires. Materials Research Express, 2020, 7, 056203.	0.8	7
48	A Novel Subarray Digital Modulation Technique for Wideband Phased Array Radar. IEEE Transactions on Instrumentation and Measurement, 2020, 69, 7365-7376.	2.4	10
49	True-Time-Delay Beamforming Receiver With RF Re-Sampling. IEEE Transactions on Circuits and Systems I: Regular Papers, 2020, 67, 4457-4469.	3.5	11
50	Rotman Lens-Based Wide Angular Coverage and High-Gain Semipassive Architecture for Ultralong Range mm-Wave RFIDs. IEEE Antennas and Wireless Propagation Letters, 2020, 19, 1943-1947.	2.4	31
51	Hybrid Precoding for WideBand Millimeter Wave MIMO Systems in the Face of Beam Squint. IEEE Transactions on Wireless Communications, 2021, 20, 1847-1860.	6.1	41
52	Optimization of a Coherent Dual-Beam Array Feed Network for Aperiodic Concentric Ring Antennas. Applied Sciences (Switzerland), 2021, 11, 1111.	1.3	1
53	Broadband continuously tunable microwave photonic delay line based on cascaded silicon microrings. Optics Express, 2021, 29, 3375.	1.7	18
54	A Broadband Balun With Tunable Phase-Shifting Function for Low-Cost Phased Array. IEEE Transactions on Antennas and Propagation, 2022, 70, 278-287.	3.1	3

#	Article	IF	Citations
55	5G as a wireless power grid. Scientific Reports, 2021, 11, 636.	1.6	52
56	W-Band Photonic Pulse Compression Radar With Dual Transmission Mode Beamforming. Journal of Lightwave Technology, 2021, 39, 1619-1628.	2.7	5
57	Beam squint effect on high-throughput millimeter-wave communication with an ultra-massive phased array. Frontiers of Information Technology and Electronic Engineering, 2021, 22, 560-570.	1.5	2
58	Array of Arrays: Optimizing Phased Array Tiles. IEEE Antennas and Wireless Propagation Letters, 2021, 20, 718-722.	2.4	5
59	Ultra-Wideband Switched-Capacitor Delays and Circulatorsâ€"Theory and Implementation. IEEE Journal of Solid-State Circuits, 2021, 56, 1412-1424.	3.5	10
60	Wideband Beamforming for Hybrid Massive MIMO Terahertz Communications. IEEE Journal on Selected Areas in Communications, 2021, 39, 1725-1740.	9.7	60
61	Modified Configurations of Array Antenna and Microstrip Rotman Lens for Multibeamforming Purpose. , 2021, , .		0
62	Terahertz Ultra-Massive MIMO-Based Aeronautical Communications in Space-Air-Ground Integrated Networks. IEEE Journal on Selected Areas in Communications, 2021, 39, 1741-1767.	9.7	46
63	Analog Radio Over Fiber Aided C-RAN: Optical Aided Beamforming for Multi-User Adaptive MIMO Design. Frontiers in Communications and Networks, 2021, 2, .	1.9	1
64	Performance Enhancement of a Planar Slot Phased Array by Using Dual-Mode SIW Cavity and Coding Metasurface. IEEE Transactions on Antennas and Propagation, 2021, 69, 6022-6027.	3.1	7
65	InFocus: A Spatial Coding Technique to Mitigate Misfocus in Near-Field LoS Beamforming. IEEE Transactions on Wireless Communications, 2022, 21, 2193-2209.	6.1	15
66	Inkjet-/3D-/4D-Printed Perpetual Electronics and Modules: RF and mm-Wave Devices for 5G+, IoT, Smart Agriculture, and Smart Cities Applications. IEEE Microwave Magazine, 2020, 21, 87-103.	0.7	24
67	A frequency-doubling microwave photonic phase shifter based on dual-polarization MZM. , 2017, , .		1
68	Integrated microwave photonic true-time delay with interferometric delay enhancement based on Brillouin scattering and microring resonators. Optics Express, 2020, 28, 36020.	1.7	10
69	Silicon integrated microwave photonic beamformer. Optica, 2020, 7, 1162.	4.8	75
70	Enhancing the directivity of a radiating array element for an optical true-time-delay network. Journal of Optics (United Kingdom), 2021, 23, 125101.	1.0	0
71	A Frequency-quadrupling Microwave Photonic Phase Shifter based on Dual-polarization MZM. , 2017, , .		0
72	Extremely Wide Bandwidth Microwave Photonic Phase Shifter for W-band Chirped Monopulse Radar. , 2018, , .		1

#	Article	IF	Citations
73	A 4-Element 800MHz-BW 29mW True-Time-Delay Spatial Signal Processor Enabling Fast Beam-Training with Data Communications. , 2021, , .		9
74	Chip-based broadband true-time delay using Brillouin scattering and phase amplification. , 2020, , .		0
75	Beam Pattern Optimization Method for Subarray-Based Hybrid Beamforming Systems. Wireless Communications and Mobile Computing, 2020, 2020, 1-7.	0.8	3
76	Low-Profile True-Time Delay Based Electronically Reconfigurable Leaky-wave Antennas. , 2020, , .		1
77	Single Snapshot DoA Estimation from a Rotman Lens using Machine Learning Techniques. , 2020, , .		1
78	A Review of Multibeam Phased Array Antennas as LEO Satellite Constellation Ground Station. IEEE Access, 2021, 9, 147142-147154.	2.6	26
79	SNR Optimization for LEO Satellite at Sub-THz Frequencies. IEEE Transactions on Antennas and Propagation, 2022, 70, 4449-4458.	3.1	12
80	Computer-Aided Payload Architecture Optimization for HTS Satellites. , 2020, , .		1
81	Design of Rotman Lens for Far-field Wireless Power Transfer at Ka-band. , 2020, , .		3
82	Ka-Band Rotman Lens-Based Retrodirective Beamforming System for Wireless Power Transfer. Journal of Electromagnetic Engineering and Science, 2021, 21, 391-398.	0.7	6
83	Optimizing Rotmen Lens Topologies for 5G Wireless Grids. , 2021, , .		1
84	Impact of Phase Shifter Design on Beam Squinting in Phased Array. , 2021, , .		0
85	Least-Squares Equalizer Demonstrations Using a Full-Digital Bandwidth Sub-Nyquist-Sampled Wideband Beamformer on an RFSoC. IEEE Transactions on Aerospace and Electronic Systems, 2022, 58, 5519-5532.	2.6	2
86	Millimeter-Wave Wideband Channel Estimation Using Analog True-Time-Delay Array Under Hardware Impairments. Journal of Signal Processing Systems, 0, , .	1.4	1
87	Design of a novel optical delay line based on ring resonators and microcomb for beamforming in a phased array radar. Ain Shams Engineering Journal, 2023, 14, 101850.	3.5	1
88	Time Delay Unit Architecture Optimization for Phased Antenna Arrays Using Integer Linear Programming. IEEE Transactions on Antennas and Propagation, 2022, 70, 9347-9356.	3.1	1
89	Photonic Beamforming for 5G and Beyond: A Review of True Time Delay Devices Enabling Ultra-Wideband Beamforming for mmWave Communications. IEEE Access, 2022, 10, 75513-75526.	2.6	14
90	Joint Phase-Time Arrays: A Paradigm for Frequency-Dependent Analog Beamforming in 6G. IEEE Access, 2022, 10, 73364-73377.	2.6	6

#	Article	IF	Citations
91	Application of the TDFA window in true optical time delay systems. Optics Express, 2022, 30, 30164.	1.7	2
92	Broadband photonic beam processor for simultaneous beamforming and high-resolution imaging. Optics Express, 2022, 30, 30198.	1.7	2
93	3-D Hybrid Beamforming for Terahertz Broadband Communication System With Beam Squint. IEEE Transactions on Broadcasting, 2023, 69, 264-275.	2.5	8
94	Wideband Beamforming using Digital Phase Only Compensation in Digital Array Radars. , 2022, , .		0
95	A LTCC-Based Ku-Band 8-Channel T/R Module Integrated with Drive Amplification and 7-Bit True-Time-Delay. Sensors, 2022, 22, 6568.	2.1	0
96	A 4-bits active inductor-based lattice 24.5â€“50Âps all-pass filter. Engineering Science and Technology, an International Journal, 2022, , 101263.	2.0	0
97	Electronically Steerable Antennas for Future Heterogeneous Communication Networks: Review and Perspectives. IEEE Journal of Microwaves, 2022, 2, 545-581.	4.9	27
98	Low-Profile True-Time-Delay Beamsteerable Leaky-Wave Antenna for Satellite Applications in the K Band. IEEE Transactions on Antennas and Propagation, 2023, 71, 236-249.	3.1	2
99	Defining Phased Array Bandwidth. IEEE Aerospace and Electronic Systems Magazine, 2023, 38, 34-42.	2.3	0
100	Demonstration of X-Band Wideband Scanning Using Hybrid Beam Steering Components. , 2022, , .		1
101	True Time Delay line RFIC for X-band Timed Array Radars. , 2022, , .		0
102	Fast Beam Alignment Via True Time Delay Frequency Dependent Beamforming Using Fixed and Variable Length Tests. , 2022, , .		0
103	DNN Beamforming for LEO Satellite Communication at Sub-THz Bands. Electronics (Switzerland), 2022, 11, 3937.	1.8	2
104	Variable optical true-time delay line breaking bandwidth-delay constraints. Optics Letters, 2023, 48, 460.	1.7	1
105	Wideband Beamforming With Rainbow Beam Training Using Reconfigurable True-Time-Delay Arrays for Millimeter-Wave Wireless [Feature]. IEEE Circuits and Systems Magazine, 2022, 22, 6-25.	2.6	2
106	A Wideband Generalization of the Near-Field Region for Extremely Large Phased-Arrays. IEEE Wireless Communications Letters, 2023, 12, 515-519.	3.2	2
107	A Variable Fractional Delay Filter Based True-Time-Delay Array Architecture for Wideband Beamforming. , 2024, 8, 1-5.		0
108	Low-Earth Orbit User Segment in the Ku and Ka-Band: An Overview of Antennas and RF Front-End Technologies. IEEE Microwave Magazine, 2023, 24, 32-48.	0.7	13

#	Article	IF	Citations
109	A Microwave Photonics True-Time-Delay System Using Carrier Compensation Technique Based on Wavelength Division Multiplexing. Photonics, 2023, 10, 34.	0.9	0
110	Bi-Directional True Time Delay Core Chip for Phased Array Radars. , 2022, , .		1
111	Optimized Design of a Variable Fractional Delay Filter With Delay Error Constraints. IEEE Transactions on Circuits and Systems II: Express Briefs, 2023, 70, 3164-3168.	2.2	0
112	An integrated photonic-assisted phased array transmitter for direct fiber to mm-wave links. Nature Communications, 2023, 14, .	5.8	5
113	Modeling and Optimization of a Range-Selective Digital Array Radar. , 2022, , .		0
114	Beam-Space MIMO Radar for Joint Communication and Sensing With OTFS Modulation. IEEE Transactions on Wireless Communications, 2023, 22, 6737-6749.	6.1	6
115	Reduced-Complexity Wideband Line-of-Sight MIMO Communication. , 2022, , .		1
116	Hybrid Beamforming for Terahertz Wireless Communications with Beam Squint: A Survey. Chinese Journal of Electronics, 2022, 31, 1043-1052.	0.7	3
117	Calibration of Aperture Arrays in Time Domain Using the Simultaneous Perturbation Algorithm. IEEE Transactions on Antennas and Propagation, 2023, , 1-1.	3.1	0
118	A Multi-layer Planar Beamfocusing Lens for 5G Communications. , 2023, , .		0
119	Wideband Precoding for RIS-Aided THz Communications. IEEE Transactions on Communications, 2023, 71, 3592-3604.	4.9	3
120	On time-delay power divider. , 2023, , .		0
123	Misfocus-Reduction in RIS-Assisted Ultra-Wideband Wireless Communication. , 2023, , .		1
124	Rotman-Lens-Based Reconfigurable Intelligence Surface mmID with Energy Harvesting Capability. , 2023, , .		0
125	A Modular System-level Testbench for 6G Beamforming Applications with Near Circuit-Level Fidelity. , 2023, , .		0
127	mmFlexible: Flexible Directional Frequency Multiplexing for Multi-user mmWave Networks. , 2023, , .		0
131	Single-Pixel Chaotic Cavity Bandwidth Control using Rotman Lens-Based Multiplexer/Demultiplexer. , 2023, , .		0
133	Implementation of Wideband DBF for Large Aperture Phased Array Radar Based on FPGA. , 2023, , .		0

#	Article	IF	Citations
134	A 5ps Resolution, 5-bit True Time Delay Chip for Wideband RF Self-Interference Cancellation. , 2023, , .		0
135	Near-Field Localization Based On Beam Squint of mmWave Communications. , 2023, , .		0
138	Phased Array Antenna Basics. , 2024, , 9-37.		0
139	A Field Trial of Broadband Photonic Beam Processor Based on Space-Time-Frequency Mapping. , 2023, , .		0
140	An Effective Hybrid Beamforming for MIMO-OFDM with Beam Squint. , 2023, , .		0
141	é¢å•6Gçš„å•é‡æž„æ™ºèƒ½è¶…è¡¨é¢: å¤”ç”¨ä€•æŒ‘æ˜å’Œè§£å†³æ–¹æ¡ˆ. Frontiers of Information Technology and Electronic Engineering	1.5	0