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Special Issue Reprint

Advanced New Physical Layer Technologies for Next-Generation Wireless Communications

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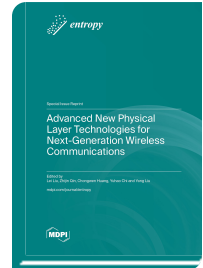
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The objective of this Special Issue is to present groundbreaking research on the latest developments in physical-layer technologies that will form the foundation of next-generation 6G wireless communications. We have gathered original research articles that explore innovative solutions to meet the demanding requirements of global convergence, enhanced spectral/energy efficiency, extreme reliability, ultra-low latency, and intelligent security for next-generation wireless communication networks. Building upon established principles of wireless communication theory, this Special Issue pushes the boundaries of current knowledge to address the limitations of 5G technologies. While conventional approaches—such as OFDM and classical information theory—have proven inadequate, revolutionary techniques including new waveforms, advanced multiple-access approaches, novel channel-coding methods, and multi-antenna technologies are now emerging. These innovations are enabling the paradigm shift from conventional terrestrial-only networks to integrated space–air–ground networks. This Special Issue highlights transformative work in key areas: classical and multiuser information theory, electromagnetic information theory, semantic-aware transceiver designs, reconfigurable intelligent surfaces, native-AI-empowered architectures, and integrated sensing and communication systems.



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