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Editorial

Metamaterials for Wireless Power Transfer: A New Open Special Issue in Materials

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Metamaterials for Wireless Power Transfer is a new open Special Issue of *Materials*, which aims to publish original and review papers on new scientific and applied research and make great contributions to the finding and understanding of the use of metamaterials for wireless power transfer (WPT) and related fundamentals, characterization, and applications.

WPT technology is becoming an important topic for the wireless industry [1], which has attracted a significant amount of attention due to its convenience, reliability, and safety. However, although the WPT technology has numerous advantages, the transfer efficiency in WPT systems decreases rapidly as the distance increases, and large electromagnetic field (EMF) noise is inevitably generated in WPT charging systems and potentially harmful to electronic components, even to human health. Metamaterials are artificially engineered composite materials or structures that exhibit special properties that are not found in nature. Metamaterials can be used to manipulate electromagnetic fields and waves, bringing entirely new physical phenomena and applications. The application of the metamaterials in WPT systems has received a great deal of attention in improving the transfer efficiency and reducing the leakage of EMF in recent years [2]. Simultaneous wireless information and power transfer (SWIPT) seems to be an attractive solution for future 6G wireless communication and IoT applications, and reconfigurable intelligent surfaces (RIS) may also be linked to metamaterials for WPT in the future.

The research interest for the Special Issue *Metamaterials for Wireless Power Transfer* includes, but is not limited to, the following: low-frequency metamaterial-based WPT systems, electromagnetic compatibility in metamaterial-based WPT systems, wireless energy harvesting (WEH), theoretical research for metamaterial-based WPT systems, magneto-inductive and resonant waves in WPT systems via metamaterials, programmable metamaterials and metasurfaces for WPT systems, and SWIPT systems based on information metamaterials and metasurfaces.

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References

1. Rim, C.T.; Mi, C. *Wireless Power Transfer for Electric Vehicles and Mobile Devices*; John Wiley & Sons: Hoboken, NJ, USA, 2017; ISBN 978111932905.
2. Zhou, J.; Zhang, P.; Han, J.; Li, L.; Huang, Y. Metamaterials and Metasurfaces for Wireless Power Transfer and Energy Harvesting. *Proc. IEEE* **2022**, *110*, 31–55. [CrossRef]

Short Biography of Authors

Long Li is a professor in the School of Electronic Engineering, Xidian University. Prof. Li is the Director of Key Laboratory of High-Speed Circuit Design and EMC, Ministry of Education, China. His research interests include metamaterials and metasurfaces, antennas and microwave devices, wireless power transfer and harvesting technology, and OAM vortex waves. He has published over 180 papers in journals and held more than 40 patents. Prof. Li was awarded the Chang Jiang Scholars Distinguished Professor by Ministry of Education, China in 2021. Prof. Li is the Vice-President of MTT-Chapter in IEEE Xi'an Section. He is a TPC Co-Chair of APCAP2017, IEEE IMWS-AMP2021, General Co-Chair of AWPT2019, and an Associate Editor-in-Chief of the *ACES* Journal, and the *Journal of Information and Intelligence*.

Minghai Liu ireceived the Ph.D. degree in physics from the University of Science and Technology of China, Hefei, China, in 1997. From 1997 to 1999, he was a postdoctoral fellow with the Institute of Plasma Physics, Chinese Academy of Sciences, Hefei. From 2002 to 2004, he was a visiting scholar with Nagoya University, Nagoya, Japan. Since 2000, he has been with Huazhong University of Science and Technology, Wuhan, China, where he is currently a professor with the State Key Laboratory of Advanced Electromagnetic Engineering and Technology. His research interests mainly include metamaterials and wireless power transfer system for electric vehicle.

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