中野久松名誉教授が西安大学において招待講演(オンライン)を行いました.

招待講演題目：超自然系材料に基づく円偏波アンテナ

Metamaterial-Based Circularly Polarized Antennas

日時：2021 年 11 月 30 日

主催 ： 西安大学

開催場所：中国・西安大学・国立重点アンテナ・マイクロ波技術研究機関

形態：ハイブリッド講演(現地およびオンライン)

講演内容：

Metamaterial-Based Circularly Polarized Antennas

Tencent Meeting（腾讯会议）ID: 728 802 455

Time: 2021/11/30 14:00-14:40

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Prof. Hisamatsu NAKANO has been with Hosei University since 1973, where he is currently a Professor Emeritus and a Special-appointment Researcher with the Electromagnetic Wave Engineering Research Institute attached to the graduate school. He has published over 360 articles in peer-reviewed journals and 11 books/book chapters. His significant contributions are the development of five integral equations for line antennas in free space and printed on a dielectric substrate, the invention of an L-shaped wire/strip antenna feeding method, and the realization of numerous wideband antennas, including curl, metaspiral, metahelical, and Body of Revolution antennas. He has been awarded 79 patents. His research topics include numerical methods for low- and high-frequency antennas and optical waveguides. He received the H. A. Wheeler Award in 1994, the Chen-To Tai Distinguished Educator Award in 2006, and the Distinguished Achievement Award in 2016, all from the IEEE APS. Most recently, he was selected as a recipient of the Antenna Award of the European Association on Antennas and Propagation (EurAAP) in 2020.

Abstract: Circularly polarized (CP) antennas are categorized as either natural or metamaterial (MTM) CP antennas. The former have an electromagnetic property found in nature (right-handed property) and the latter have an electromagnetic property not existing in nature (left-handed property or composite right- and left-handed property). This talk presents MTM line (metaline) antenna, MTM loop (metaloop) antenna, MTM spiral (metaspiral) antenna, and MTM curl (metacurl) antenna. Note that these MTM antennas have a low-profile structure on the order of l/100 wavelength. Firstly, it is described that the metaline antenna exhibits a CP beam-scanning characteristic with change in frequency. It is also described that an array of bent metalines realize CP beam scanning. Secondly, analysis of metaloop antenna finds that it possesses a counter CP dual band characteristic, i.e., left-handed CP radiation across a specific frequency band and right-handed CP radiation across a different frequency band. Thirdly, discussion of metaspiral antenna is directed toward CP beam-scanning capability in both the azimuth and elevation planes. Fourthly, exploration of metacurl antenna reveals that the antenna can radiate a left-handed CP wave and a right-handed CP wave, where both have the same maximum gain.