Metasurface Antennas: Dual-Band Modulation Using Characteristic Mode Analysis (CMA)

Metasurface has been proposed for around 20 years and it still attracts a lot of attention today due to its unique electromagnetic characteristics and simple in implementation. With the combination of antenna, it presents infinite possibilities in microwave engineering applications. The object of this talk is to investigate the electromagnetic properties of metasurface based on characteristic mode analysis (CMA) and to reveal the mechanism of modes control, especially the independent modes modulation for the metasurface. Furthermore, with the help of another characterization method, such as reflection or transmission response of planar wave illumination, the additional electromagnetic property is possible to be integrated with metasurface in terms of unit structure combination, which results in hybrid modes modulations for the metasurface. Based on these modulation methods, innovative designs of dual-band and shared-aperture metasurface antennas will be presented as well and the excellent performances permit them a promising candidate for 5G dual-band applications.

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