

Water-based metamaterials for advanced microwave control and sensing

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Abstract

With the increasing focus on ecological compatibility and recyclability of electromagnetic materials, immense efforts are applied to find cheap and bio-friendly alternatives. Such material at microwave frequencies can be just conventional water. Water in this range of interest has high dielectric permittivity, and can be used to engage strong Mie resonances in the devices performance for enhanced scattering and absorption of microwaves even in single inclusions. In the talk I review different water-based devices for microwave control and sensing. Among the effective implementation of water-based elements there are examples of metasurfaces, absorbers, dielectric resonance antennas, radio-frequency components and structures with a so-called bound state in the continuum as a sensor.