Meta-Atoms for 3D Printing Metamaterials

In this talk we will introduce the concept and uses of Meta-Atoms (MTAs) in Electromagnetic metamaterials. MTAs take the form of metallic or dielectric meso scale cuboid inclusions which could be 3D-printed in multi-layered metamaterials with different periodicities. Potentially these meta-atoms could be varied in constitution and geometry to augment a variety of artificial magnetodielectric properties. The effect of their periodicity on the effective EM properties (constitutive parameters) is examined by placing the 3D-printed samples in a waveguide or on a resonator. Some of these structures have been applied in engineering applications such as 3D antennas, filters and microwave lenses, prototypes of which will be shown.

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Yiannis Vardaxoglou's current research focuses primarily on metamaterial structures, additive manufacturing (3D printing) for RF/micro/mm wave engineering and Frequency Selective Surfaces (FSS). He has led a team of the Symeta research centre (www.symeta.co.uk) funded by an EPSRC Grand Challenge award, researching in a wide-ranging metamaterial topics applicable to cutting-edge wireless communications technology. Symeta collaborates with many internationally leading companies and universities. Yiannis has authored a few hundred publications (scholar.google.com), several book chapters and a seminal book on FSS.

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