University of Texas at San Antonio

Department of Physics & Astronomy

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Mechanical Engineering — Boston University

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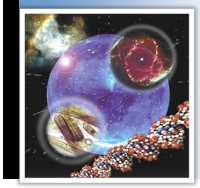
Metamaterial Enhanced MEMS for Terahertz Technology

Metamaterials have ignited a world-wide flurry of research based in part on the realization of negative refractive index, and the idea of co-ordinate-transformation design of materials leading to exotic phenomena such as electromagnetic cloaking or energy concentration. The implementation of such ideas is exciting, but is most likely a long-term proposition in terms real-world applications. Briefly, metamaterials are sub-wavelength composites where the electromagnetic response originates from oscillating electrons in highly conducting metals such as gold or copper allowing for a design specific resonant response of the electrical permittivity or magnetic permeability. This is especially important for the technologically relevant terahertz frequency regime where there is a strong need to create components to realize applications ranging from spectroscopic identification of hazardous materials to noninvasive imaging. Our recent research focuses on creating active structures and devices to enhance our ability manipulate and detect far -infrared, or terahertz, radiation by combining electromagnetic metamaterials with MEMS technologies. In this talk, I will explore the development of functional terahertz metamaterial structures and devices using MEMS technologies, which show extreme power at the micro scale level.



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