

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 27 October 2016

17:00 -18:00

3rd Floor Seminar Room

" Mechanisms of Terahertz emission in semiconductors
for time domain spectroscopy "

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Abstract

In the Terahertz (THz) laboratories group we work on developing novel THz emitters and components and on using THz time domain spectrometry to understand the function of photonic and biological systems.

I will present THz emitters based on diffusion currents where terahertz radiation can be generated by ultrafast photo-excitation of carriers in a semiconductor. I will present 2D simulations of the THz generation effect taking into account the diffusion of carriers and the electric field using finite differences time domain simulations. Multiplexed emitter geometries will also be shown such as double-metallic multiple emitters which operate under uniform illumination and are fabricated with periodic Au and Pb structures on GaAs. Terahertz emission in this case originates from diffusion currents and from the different Schottky barrier heights of the chosen metallic pair. I will demonstrate how our large area multiplexed emitters can be used in order to achieve THz focusing.

Finally, I will present our work on the development of THz polarization components and show highlights of current and future research on detection of plasmonic resonances in the THz spectrum and protein function.