MASTER IN PHOTONICS – "PHOTONICS BCN" ERASMUS+ "EUROPHOTONICS"

MASTER THESIS PROPOSAL

Dates: April - September 2019

Laboratory : CommSensLab
Institution: UPC
City, Country : Barcelona, Spain

Title of the master thesis: Modelling and characterization of THz Photoconductive Antennas.

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Keywords : THz, spectrography

Summary of the subject (maximum 1 page) :

Compact and cost-effective photoconductive antennas have opened a broad avenue for THz applications including but not limited to security screening, chemical finger-printing, biomedical diagnosis, non-destructive inspection and broadband wireless communications. Despite its commercial success and fairly good performances in the aforementioned applications, the presently achieved power efficiencies are still low, and a consensus about equivalent models that would allow to define systematic optimization procedures is yet to be reached.
In this master thesis we aim at acquiring a deep understanding of the complex process of photocarrier's generation and transport in phoconductive antennas, and to define simple models that retain the most fundamental features of the processes involved. The ultimate goal will be to find systematic procedures to increase the power efficiency through proper design of the electrode structure and the optimization of the impedance matching to the radiating element.
The commercial electromagnetics simulator CST will be used to characterize the electrodes and radiating elements in combination with Matlab for simulating the photocarrier generation.

Additional information :
* Required skills : Due to the complexity of the topic we are looking for highly motivated students with a good academic record.

* Miscellaneous :