OPTICAL ANTENNAS FOR NANOPHOTONICS APPLICATIONS

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In the recent past, the scientific and technological community has paid larger attention to nanoscale devices. Antenna-coupled optical detectors, also named as optical antennas, are being developed and proposed as alternative detection devices with nanoscale features for the millimetre, infrared, and visible spectra. Optical and infrared antennas stand for a class of optical components that couple electromagnetic radiation in the visible and infrared wavelengths in the same way that radioelectric antennas do at the corresponding wavelengths. The size of optical antennas is in the range of the detected wavelength and they involve fabrication techniques with nanoscale spatial resolution. Optical antennas have already proved and potential advantages in the detection of light showing polarization dependence, tuneability, and rapid time response. They also can be considered as point detectors and directionally sensitive elements. So far, these detectors have been thoroughly tested in the mid-infrared with some positive results in the visible. The measurement and characterization of optical antennas requires the use of experimental set-up with nanometric resolution. On the other hand, a computation simulation of the interaction between the material structures and the incoming electromagnetic radiation is needed to explore alternative designs of practical devices. In this contribution we will present the practical realization of optical and infrared antennas and some experimental results of their performance, along with the optical set-up arranged for their characterization in the visible.