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## SWIR photo-detection enhanced by sub-wavelength structuration

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The extreme light confinement provided by sub-wavelength metal-dielectric structures pushes towards revisiting the design rules of the photo-detectors. Furthermore, introducing absorbing layers in optical nano-resonators demands a dedicated electromagnetic design. Developing together semiconducting heterostructures and optical nano-antennas opens the way for performance improvements and new functionalities, introducing very promising features such as ultra-thin absorbing layers and device area much smaller than its optical cross-section. High responsivity, high speed behavior, and carved optical response are among the expected properties of this new generation of photo-detectors. In this talk, I present a GMR InGaAs photo-detector dedicated for FPA applications as an illustration of this global design. I discuss the cross-linked properties of the optical and semiconductor structures. Experimental results show at  $\lambda=1.55 \mu\text{m}$  an EQE of 75% and a specific detectivity of  $10^{13} \text{ cm. Hz.W}^{-1}$ .

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