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# MICROFABRICATION OF A PHOTO-SWITCH UTILIZING REDUCED GRAPHENE OXIDE (RGO) DECORATED WITH NICKEL (NI) NANOPARTICLES AS AN ACTIVE MATERIAL FOR OPTICAL COMMUNICATIONS

This study presents the micro-manufacturing process and radio frequency (RF) evaluation of a Metal-Semiconductor-Metal (MSM) type photodetector, utilizing reduced graphene oxide (rGO) decorated with nickel nanoparticles as the photosensitive material for light detection. The photodetector was initially designed with a Ground-Signal-Ground (G-S-G) configuration to determine the spacing between these elements. The microfabrication process followed, including electron lithography, rGO deposition via the Langmuir-Blodgett method, and component metallization. During this stage, scanning electron microscope (SEM) micrographs were produced to verify the correct application of the nanomaterial and examine the details of the photodetector's manufacturing process. Finally, the RF characteristics were evaluated using a vector network analyzer (VNA) alongside a 1550 nm optical stimulus to determine the scattering parameters (S parameters) in terms of reflection (S11) and transmission (S21). These devices can be integrated into microwave systems, both passive and active, for control through optical excitation.

## Keywords

Langmuir-Blodgett method, Metal-Semiconductor-Metal (MSM), photodetector, optical, microfabrication

## Reference

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## Author approval

I confirm

## Author will attend

I confirm

**Author:** CÓRDOVA MORALES, Pablo

**Co-authors:** HILARIO PEREZ, Gustavo (Instituto Politécnico Nacional); MORALES VITE, Alfredo David (Instituto Politécnico Nacional, SEPI-ESIME Zacatenco); MAGAÑA JACOBO, Jonatan Jesus (Instituto Politécnico Nacional, SEPI ESIME Ticomán); DURÁN LEDEZMA, Ángel Adalberto (Instituto Politécnico Nacional, SEPI-ESIME Ticomán); MUÑOZ AGUIRRE, Narciso (Instituto Politécnico Nacional, SEPI ESIME Azcapotzalco); MARTÍNEZ RIVAS, Adrián (Instituto Politécnico Nacional, Centro de Investigación en Computación); VALDEZ PÉREZ, Donato (Instituto Politécnico Nacional, SEPI-ESIME Zacatenco)

**Presenters:** CÓRDOVA MORALES, Pablo; VALDEZ PÉREZ, Donato (Instituto Politécnico Nacional, SEPI-ESIME Zacatenco)

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