

### **Magnitude modulation of microwave signals by ultrafast control of membrane LT-GaAs photoswitching devices**

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**Abstract** – Microwave photonics contributes through ultrafast devices to the processing of high data rates. In this area, microwave photoconductive switches (MPCSs) in integrated technology have proved their performances to control the transmission of high frequency signals in complex systems. A description of MPCSs design and modeling procedures are presented. in order to take into account different types of modulation applied on the optical signal in commercial simulation softwares. MPCSs design tools accuracy is enhanced thanks to feedback extraction of electrical and optical parameters from experimental results of MPCSs, obtained in frequency and time domains and in a microwave photonics probe test environment. Experimental validation of a dedicated structure of MPCSs leads today to microwave efficiency enhancements of MPCSs in terms of magnitude switching and phase shifting of microwave signals. New microwave LT GaAs photoswitching devices performances are reported, revealing microwave efficiency of membrane integrated technology and electrodes design. Picosecond impulse magnitude modulation of a microwave carrier by femtosecond optical pulses control is experimentally demonstrated.