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Guilhem Almuneau

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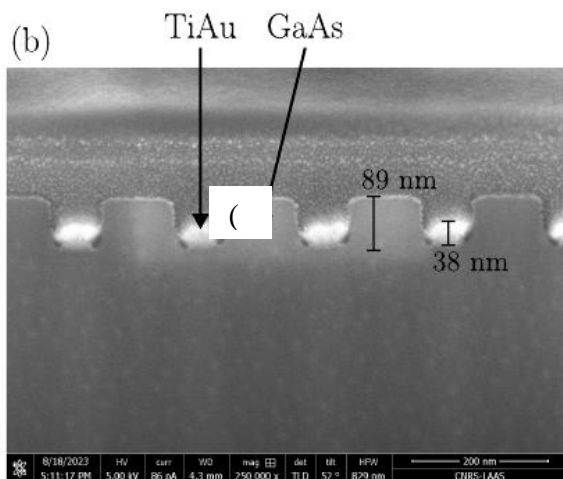
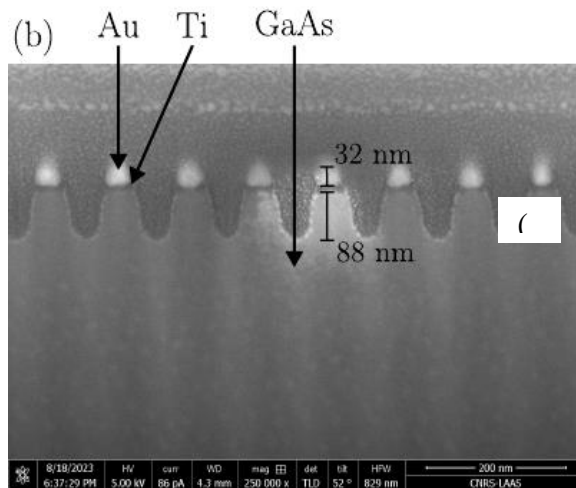
N. Monvoisin¹, F. Carcenac¹, A. Lecestre¹, B. Reig¹, S. Calvez¹, O. Gauthier-Lafaye¹, W. Glowadzka², T. Czyszanowski², G. Almuneau¹

1. LAAS-CNRS, Université de Toulouse, CNRS, Toulouse, France

2. Photonics Group, Institute of Physics, Łódź University of Technology, Poland

E-mail: almuneau@laas.fr

We will present the fabrication of a novel approach for transparent electrodes based on a semiconductor deep-subwavelength monolithic high-contrast grating (MHCG) integrated with metal stripes [1]. Two types of combination between GaAs-based MHCG and Au stripes within a deep sub-wavelength grating enable high transmission (>80%), associated with a low sheet resistance, have been measured for TE and TM polarizations respectively in the near-infrared (around 940nm). These structures, that mainly rely on the high refractive index of the employed semiconductor, can be optically designed as highly transparent or highly reflective, in a broad spectral range below the semiconductor band-gap. Electrical injection uniformity in optoelectronics devices such as LED or VCSEL could strongly benefit from this new approach.



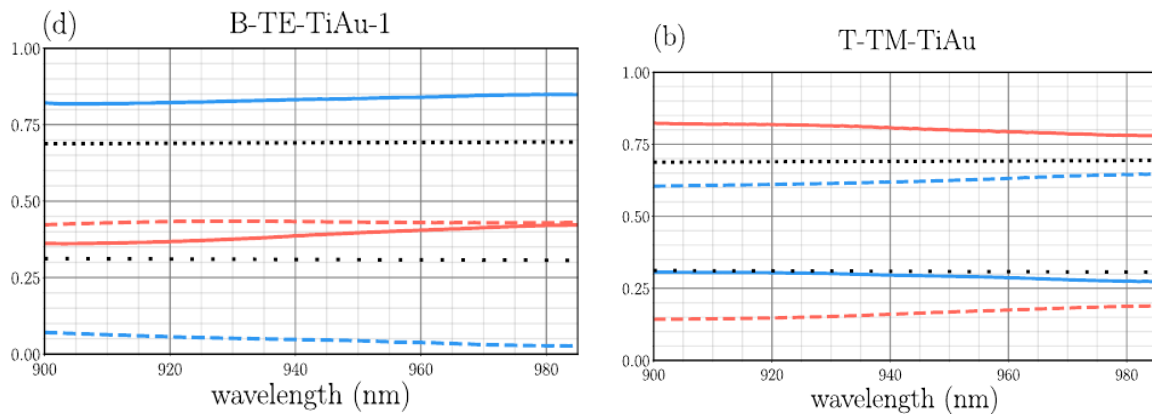


Fig. 1 Fabrication and optical characterization of semiconductor-metal deep-subwavelength gratings. (a,c) TE configuration with metal stripes in the grating grooves. (b,d) TM configuration with metal stripes above the grating ridges.

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References

- [1] T. Czystanowski, A.K. Sokół, et al. "Transparent Electrode Employing Deep-Subwavelength Monolithic High-Contrast Grating Integrated with Metal", *Optics Express* **28.19**, 28383 (2020).