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Large Area Biplasmonic Substrates Obtained by Picosecond Laser Pulses

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Bimetallic nanostuctures have the potential to become the new generation candidates for applications in catalysis, electronics, optoelectronics, biosensors, and surface-enhanced Raman Spectroscopy (SERS). The bimetallic nanocrystals could have additional properties over the single metal components.

This work presents the optimization process that was used in the fabrication of large area biplasmonic substrates employing picosecond laser pulses and a digital galvano scanner. Our aim was to achieve large area homogeneous substrates while having a good and predictable signal amplification by SERS effect. Silver thin films with different thickness were deposited on optical polished substrates and then irradiated with λ=1064 nm wavelength laser pulses with 8 ps pulse duration and 500 kHz repetition rate. Various laser fluences and laser irradiation speeds were employed in our experiments in order to optimize the Laser-induced periodic surface structures (LIPSS).

The results will be presented comparatively for laser processed bimetallic Al-Ag and raw Aluminium substrates.

Biography:

Mr. Andrei Stochioiu graduated Polytechnic University of Bucharest in 2017. His specialty is Electronics. From 2018 he is working as research assistant at Center for Advanced Laser Technologies (CETAL), National Institute for Laser, Plasma and Radiation Physics, Romania. His main research subject implies Raman Spectroscopy and its related applications.