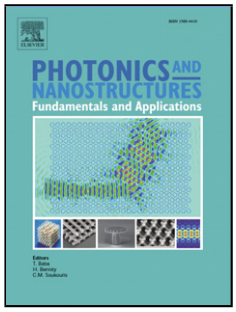

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Silver films over silica microspheres (AgFOSM) as SERS substrates

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Highlights

- We design an active Raman-SERS substrate consist of a silver thin film evaporated onto a monolayer of silica microspheres (AgFOSM) using the nanosphere lithography (NSL) technique.
- The samples were tested using Rhodamine 6G as analyte and the Raman signal is always more intense for two or three orders of magnitude for the AgFOSM samples than for the Ag maskless ones (Ag film directly deposited onto the silicon or quartz substrate).
- The SERS enhancement factors are at least of the order of 10_4 for the AgFOSM samples.

Abstract

Through the years, nanosphere lithography (NSL) has attracted a growing interest because of its potential to manufacture a wide variety of homogeneous arrays of nanostructures. In this work, NSL was used for the fabrication of Surface-Enhanced Raman Spectroscopy (SERS) substrates. The proposed Raman-SERS substrates consist of 50 nm or 120 nm thick silver thin films evaporated over a monolayer of silica microspheres (AgFOSM) onto silicon or quartz substrates. The samples were tested as SERS substrates using Rhodamine 6G as analyte. As a comparison and to determine the Raman enhancement factor, not only the AgFOSM samples were measured,