

Abstract Submitted
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Tuning of plasmonic resonance via modification of the shape factor of silver pillars embedded in nanopatterned silicon JEFFREY SHAINLINE, Brown University Department of Physics, JIMMY XU, Brown University Division of Engineering and Department of Physics, XU LAB TEAM — We present a study of the feasibility of achieving “complete resonance” [1] in a system where silicon-on-insulator (SOI) is coupled to silver nanopillars. The SOI structure is nanopatterned using reactive ion etching through an anodized aluminium oxide etch mask to contain a periodic array of pores with radius 50nm and pitch 100nm. The resultant pores are filled with silver. The plasmonic response of the silver is studied. Attempts are made to achieve complete resonance by 1) tuning the dielectric environment of the silicon by injecting optical gain (tuning the imaginary part of the dielectric function) and by 2) modifying the shape factor of the embedded silver pillars by changing the shape of the pores in the template used for the etching. In this talk the theoretical elements will be briefly reviewed and results of recent experiments will be presented. [1] A. Smuk and N. Lawandy, Appl. Phys. B 84, 125 (2006)

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