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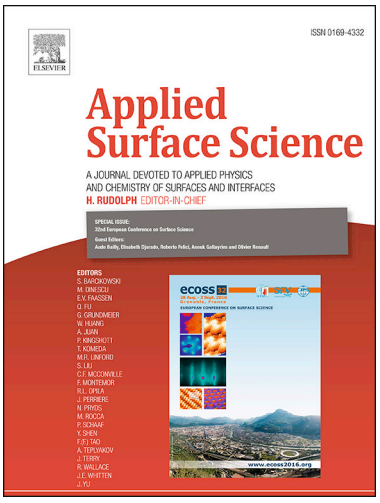

Full Length Article

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Improving photovoltaic performance of silicon solar cells using a combination of plasmonic and luminescent downshifting effects

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Abstract

This paper reports on efforts to improve the photovoltaic performance of crystalline silicon solar cells by combining the plasmonic scattering of silver nanoparticles (Ag NPs) with the luminescent downshifting (LDS) effects of Eu-doped phosphors. The surface morphology was examined using a scanning electron microscope in conjunction with ImageJ software. Raman scattering and absorbance measurements were used to examine the surface plasmon resonance of Ag NPs of various dimensions in various dielectric environments. The fluorescence emission of the Eu-doped phosphors was characterized via photoluminescence measurements at room