

# Some considerations on the design of micro-fabricated photovoltaics

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Planar Si substrates typically reflect about 35% of incident solar irradiance. The theory of scattering and absorption of light by Si microspheres and by Si-dielectric microsphere dimers shows that they can significantly reduce reflection losses and thereby potentially enhance the harnessing of solar power. Calculations indicate that the flux-weighted, band-averaged absorption of an array of Si microspheres can be on the order of 60% greater than that for Si thin films of equal mass. It is seen that an over layer of dielectric microspheres can also reduce reflectance losses and, in addition, concentrate energy into specific regions of the Si photodiodes. Numerical results will be presented, as will suggestions for the design of more efficient solar panels.

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