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**ABSTRACT:** This project set out to discover if the enhancement of absorption in a thin layer of silicon is of significance by the inclusion of metallic nanowires in a periodic array on the surface. Through varying the design parameters optical absorption was maximised. The main application of electric field enhancement is a straightforward way to increase the efficiency of solar cells. The silicon-gold structure was designed and optical properties simulated using DiffractMod. (The software employs RCWA –rigorous coupled wave analysis.) The data collected was analysed in Matlab. Various structures were designed and optical responses tested.