Plasmon-Enhanced Light-Trapping for Thin-Film Solar Cells

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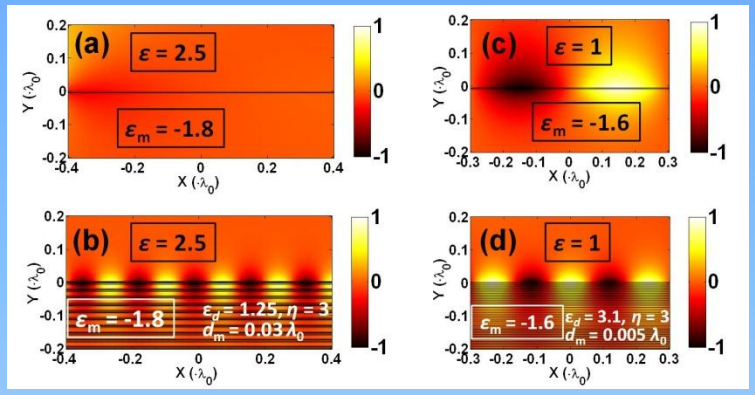
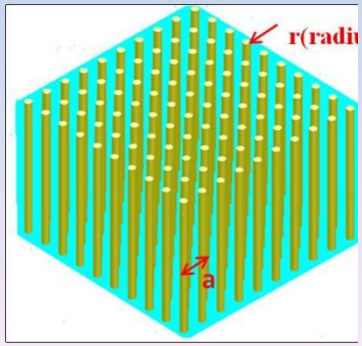
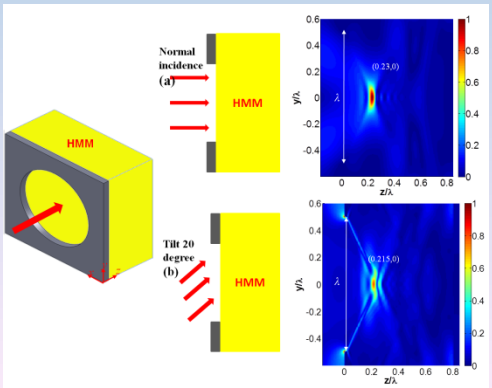
***Metametal**:* We proposed a very novel concept of "metametal" and experimentally showed that the absorption spectrum of metal surface modes can be engineered by metal-insulator stacks, where the insulator films act as the dopant of the metal films. This finding would empower researchers to tailor the resonance frequencies or absorption spectrum for nanophotonic, biomedical, or photovoltaic applications.



Super Power Concentration: In another project, an anisotropic metamaterial is realized using a wired structure, which results in a unique hyperbolic dispersion. Based on the hyperbolic dispersion material, we were able to experimentally demonstrate super power concentration and some other first-ever phenomena.





Absorption of Graphene: We studied the optical conductivity, dielectric constant, and absorption of graphene under different chemical potentials (or gate voltages).