Dear Editor:

I would like to submit the manuscript, “*Unique hot-carrier distributions from scattering mediated absorption,”* by J. Codrington, N. Eldabagh, K. Fernando, and myself for consideration in ACS Photonics. This manuscript elucidates the quantum dynamics of hot-carriers generated by a novel nanophotonics phenomenon known as scattering-mediated absorption that was first described by two of the current authors and others in a recent article [Zhang *et al.,* Nat. Photon*.* **10**, 473-482 (2016)]. This phenomena was realized in hybrid nanostructures consisting of dielectric nanospheres decorated with small platinum nanoparticles, and was shown to facilitate selective photocatalytic oxidation of benzyl alcohol to benzaldehyde under low-light conditions.

We develop a multi-scale theoretical methodology that employs time-domain electrodynamics to achieve a rigorous description of how light is shaped in space and time by complex nanostructures and bridges this information with real-time dependent configuration interaction singles theory for evolving the electronic dynamics.

Employing this methodology to study the hot-carrier dynamics induced by scattering mediated absorption reveals that

1. Hot carriers can be efficiently generated in metal nanoparticles through scattering mediated absorption even in the absence of strong optical resonances (e.g. plasmons) on the metal nanoparticles themselves
2. The distributions and dynamics of hot carriers generated by scattering mediated absorption are unique when compared to distributions and dynamics of hot carriers generated by plasmon resonance
3. Both the populations and lifetimes of hot carriers can be enhanced by tuning of the resonance frequency and linewidth of the dielectric scattering resonances that give rise to scattering mediated absorption

We believe that these results represent an important insight into a new nanophotonics phenomenon, as well as an important step towards enhancing the efficiency, selectivity, and applicability of photocatalysis and energy conversion mediated by engineered nanostructures. We therefore believe our results are sufficiently novel and impactful to meet the stringent requirements to be published in ACS Photonics.

Sincerely,

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