

Latest advances in novel plasmonic luminescent solar devices

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Abstract:

Luminescent solar devices have been investigated since the 1970's [1,2]. This paper presents how recent material advances has led to plasmonic enhancement of these luminescent devices. Plasmonic Luminescent Down-Shifting (pLDS) and Plasmonic Luminescent Solar Concentrators (pLSC) are new optical approaches to increasing PV device efficiency by using plasmonic coupling between luminescent materials and Ag or Au metal nanoparticles (MNP) [3, 4]. Using MNPs the optical properties of fluorescent species can exhibit dramatic spectral changes in their presence. This work exploits plasmonic coupling phenomena to enhance absorption/emission in luminescent devices. Through modelling and experiment, novel luminescent devices have been optimised and most recent results will be presented in this paper.

References:

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Biography

Sarah McCormack is an Associate Professor in the Dept of Civil, Structural and Environmental Engineering at Trinity College Dublin. She took up a faculty position at Trinity in 2009 and was made a Fellow of the College in 2016. She has PhD, MAI and BSc degrees in Science & Engineering from Ulster University. Her main research topic is luminescent solar devices enabling concentration of diffuse solar radiation of higher latitude climates. She is a current recipient of an ERC Starter Grant (2015 - 2020) and was recently successful in obtaining H2020 funding to coordinate a 14-partner project IDEAS (2019-2022), based on the integration of renewable energy technologies in a more holistic and integrated manner.



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