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Photon Management for Efficient Hybrid Perovskite Solar Cells via Synergetic Localized Grating and Enhanced Fluorescence Effect

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ABSTRACT: Organic-inorganic perovskite solar cells have been highlighted as one of the most competitive thin film photovoltaics recently. It is promising to further raise the power conversion efficiency if high quality absorber is coupled with rational optical design for effective photon management. Here we demonstrate the implementation of perovskite nanostructure assembly by simple solution process to interfere the propagation of light inside the adjacent absorber. It enhances light harvesting to obtain higher attainable photocurrents and photovoltage in the resultant devices, achieving a decent power conversion efficiency (PCE) over 19% consequently. The presented nanostructure assembly integrates perovskite materials with desirable processibility and chemical compatibility by chemical synthesis and interface modification. For

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