

Abstract Submitted  
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**Conversion of concentrated solar radiation by quantum dots with built-in charge**<sup>1</sup> NIZAMI VAGIDOV, Optoelectronic Nanodevices LLC, ANDREI SERGEEV, VLADIMIR MITIN, University at Buffalo, KIMBERLY SABLON, U.S. Army Research Laboratory, Adelphi, SERGE OKTYABRSKY, MICHAEL YAKIMOV, University at Albany — Quantum dots with built-in charge provide broadband conversion, which includes IR range of solar radiation. The multistep IR harvesting in quantum dots (QD) is strongly enhanced by the n-doping of the interdot space. The doping also suppresses electron capture processes and reduces recombination losses. We designed, fabricated, tested, and optimized the solar cell devices with charged QDs. Basic parameters of the devices (short circuit current, open circuit voltage, and conversion efficiency) are investigated in the range of 1 – 100 Suns. It has been experimentally demonstrated that the conversion of IR radiation increases with concentration. The effect is associated with extraction of electrons from charged QDs due to interaction with hot electrons.

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