Abstract Submitted
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Transport studies of quantum dots sensitized single Mn-ZnO nanowire field effect transistors[1] KESHAB R SAPKOTA, FRANCIS SCOTT MALONEY, GAURAB RIMAL, UMA POUDYAL, JINKE TANG, WENYONG WANG, Univ of Wyoming — We present opto-electrical transport properties of Mn-CdSe quantum dots (QDs) sensitized single Mn-ZnO nanowire (NW) field effect transistors (FET). The ZnO NWs with 2 atomic % of Mn doping are grown by chemical vapor deposition. The NWs are ferromagnetic at low temperature. The as grown nanowires are transferred to clean SiO2/Si substrate and single nanowire field effect transistors (FET) are fabricated by standard e-beam lithography. Mobility and carrier concentration of Mn-ZnO NWs are estimated from FET device measurement which shows NWs are n-type semiconductors. Pulse laser deposition of Mn-CdSe QDs on the single NW FET significantly increases carrier concentration of the QD-NW system in dark where the QD monolayer conduction is negligibly small. The photoconductivity study of QD sensitized NW FET enlightens the conduction spectrum of QD-NW system and QD to NW carrier transfer mechanism.

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