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Adaptable Quantum Dot Nanomaterials for IR Sensing XIANG ZHANG, ANDREI SERGEEV, VLADIMIR MITIN, State Univ of NY - Buffalo, KIMBERLY SABLON, U.S. Army Research Laboratory, MICHAEL YAKIMOV , SERGE OKTYABRSKY, State Univ of NY - Albany, STATE UNIV OF NY - BUFFALO TEAM, U.S. ARMY RESEARCH LABORATORY COLLABORATION, STATE UNIV OF NY - ALBANY COLLABORATION — IR nanomaterials with the effective control of photoelectron processes will strongly enhance sensing technologies for security, driving, navigation and other applications. Development and implementation of sensors with adaptable parameters would provide optimal use of sensing resources. Voltage-tunable, three-dimensional nanoscale profile created by charged quantum dots provides an effective tool to manage nanoscale processes. We experimentally investigate the effects of selective bipolar doping of quantum dot media on the dark current, noise current, photoresponse, and photoelectron lifetime. We also study the redistribution of the built-in dot charge under the voltage bias and tunability of the above characteristics. The preliminary results show a strong effect of nanoscale barriers on noise and photoresponse characteristics of IR nanomaterials.

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