OPTODET: Simulation Software for Modeling Optical Photodetectors BAHRAM ZANDI, ARL, DRAGICA VASILESKA, Arizona State University, PRIYALAL WIJEWARNASURIYA, ARL — In this work, we report the development of a new simulation software specifically designed for modeling optical photodetectors – OPTODET. The tool self-consistently solves the continuity equations of the electrons and holes with the Poisson equation, to provide information on the magnitude of the photodetector dark current, spectral responsivity and quantum efficiency in the presence of Schockley-Read-Hall, optical Auger generation/recombination mechanisms and light illumination. The tool then calculates the noise equivalent power (NEP) needed for the calculation of the detectivity of the photodetector being investigated. At present, the tool is tailored at modeling of HgCdTe medium wavelength infrared (MWIR) and HgCdTe long wavelength infrared (LWIR) photodetectors, but a larger database of different materials and of different heterostructures will be made available to the users in the near future. These include the reverse bias potential profiles, the reverse saturation current variation with reverse bias and a plot from which the R_oA product is extracted at zero bias, respectively. The photodetector characteristics are as follows: the alloy composition is x=0.225 at which value HgCdTe is a semiconductor, the n-type region is 10 um thick and has doping of 10^{15} cm^{-3}, the p-type region is 0.8 um thick and is doped to 2×10^{17} cm^{-3}.

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