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Abstract: In this paper we present results on the optimization of multilayered a-SiC:H heterostructures that can be used as optical transducers for fluorescent proteins detection using the Fluorescence Resonance Energy Transfer approach. Double structures composed by pin based aSiC:H cells are analyzed. The color discrimination is achieved by ac photocurrent measurement under different externally applied bias. Experimental data on spectral response analysis, current-voltage characteristics and color and transmission rate discrimination are reported. An electrical model, supported by a numerical simulation gives insight into the device operation. Results show that the optimized a-SiC:H heterostructures act as voltage controlled optical filters in the visible spectrum. When the applied voltages are chosen appropriately those optical transducers can detect not only the selective excitation of specimen fluorophores, but also the subsequent weak acceptor fluorescent channel emission.

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