

**Title:** Detection of FRET signals with a wavelength sensitive device based on a-SiC:H

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**Abstract:** Glucose sensing is an issue with great interest in medical and biological applications. One possible approach to glucose detection takes advantage of measuring changes in fluorescence resonance energy transfer (FRET) between a fluorescent donor and an acceptor within a protein which undergoes glucose-induced changes in conformation. This demands the detection of fluorescent signals in the visible spectrum. In this paper we analyzed the emission spectrum obtained from fluorescent labels attached to a protein which changes its conformation in the presence of glucose using a commercial spectrofluorometer. Different glucose nanosensors were used to measure the output spectra with fluorescent signals located at the cyan and yellow bands of the spectrum. A new device is presented based on multilayered a-SiC:H heterostructures to detect identical transient visible signals. The transducer consists of a p-i'(a-SiC:H)-n/p-i(a-Si:H)-n heterostructure optimized for the detection of the fluorescence resonance energy transfer between fluorophores with excitation in the violet (400 nm) and emissions in the cyan (470 nm) and yellow (588 nm) range of the spectrum. Results show that the device photocurrent signal measured under reverse bias and using appropriate steady state optical bias, allows the separate detection of the cyan and yellow fluorescence signals. (C) 2013 Elsevier B.V. All rights reserved.

**Author Keywords:** SiC hetrostructures; Optical sensors; Fluorescence proteins; Glucose nanosensors

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