Title: a-SiCH Based Devices as Optical Demultiplexers

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Abstract: In this paper we present results on the use of a multilayered a-SiC:H heterostructure as a wavelength-division demultiplexing device (WDM) for the visible light spectrum. The WDM device is a glass/ITO/a-SiC:H (p-i-n)/ a-SiC:H(p) /Si:H(i)/SiC:H (-n)/ITO heterostructure in which the generated photocurrent at different values of the applied bias can be assigned to the different optical signals. The device was characterized through spectral response measurements, under different electrical bias. Demonstration of the device functionality for WDM applications was done with three different input channels covering wavelengths within the visible range. The recovery of the input channels is explained using the photocurrent spectral dependence on the applied voltage. The influence of the optical power density was also analysed. An electrical model, supported by a numerical simulation explains the device operation. Short range optical communications constitute the major application field, however other applications are also foreseen.

Keywords Plus: a-SiCH Based Devices; Optical Demultiplexers

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