Title: Optical Filter Design Using Background Wavelength Processing Techniques

Author(s): Vieira, M. [1,2,3]; Vieira, M. A. [1,2]; Louro, P. [1,2]; Silva, V. [1,2]

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Abstract: Amorphous SiC tandem heterostructures are used to filter a specific band, in the visible range. Experimental and simulated results are compared to validate the use of SiC multilayered structures in applications where gain compensation is needed or to attenuate unwanted wavelengths. Spectral response data acquired under different frequencies, optical wavelength control and side irradiations are analyzed. Transfer function characteristics are discussed. Color pulsed communication channels are transmitted together and the output signal analyzed under different background conditions. Results show that under controlled wavelength backgrounds, the device sensitivity is enhanced in a precise wavelength range and quenched in the others, tuning or suppressing a specific band. Depending on the background wavelength and irradiation side, the device acts either as a long-, a short-, or a band-rejection pass filter. An optoelectronic model supports the experimental results and gives insight on the physics of the device.

Author Keywords: Optical sensors; Optical bias control; Short-pass long-pass and band-rejection pass filters; WDM communication systems in the visible range

Reprint Address: Vieira, M (reprint author) - ISEL, Elect Telecommun & Comp Dept, R Conselheiro Emídio Navarro, P-1959-007 Lisbon, Portugal

Addresses:
[1] ISEL, Elect Telecommun & Comp Dept, P-1959007 Lisbon, Portugal
[2] CTS UNINOVA, P-2829516 Monte De Caparica, Caparica, Portugal
[3] DEE FCT UNL, P-2829516 Monte De Caparica, Caparica, Portugal

E-mail Addresses: mv@isel.pt

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