Title: Optical Filter Design Using Background Wavelength Processing Techniques

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Source: Plasmonics **Volume:** 8 **Issue:** 1 **Pages:** 121-127
DOI: 10.1007/s11468-012-9434-5 **Published:** Mar 2013

Conference: Spring Meeting of the European-Materials-Research-Society (E-MRS)/Symposium N/ Symposium
Location: Strasbourg, France **Date:** May 14-18, 2012
Sponsor(s): European Mat Res Soc (E-MRS)

Document Type: Proceedings Paper

Language: English

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

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Publisher: Springer
Publisher Address: 233 Spring ST, New York, NY 10013 USA

ISSN: 1557-1955

Citation: VIEIRA, M.; VIEIRA, M. A.; LOURO, P.; SILVA, V. - Optical Filter Design Using Background Wavelength Processing Techniques. Plasmonics. ISSN 1557-1955. Vol. 8, nr 1 (2013), p. 121-127.