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A method for deselection of defective photosensitive elements which most decrease the signal-to-noise ratio in channels of an infrared focal-plane array with time delay integration mode

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A new method of deselection has been developed, relating to defect detection tool in infrared (IR) focal-plane array (FPA) with time delay integration (TDI) mode. The developed method is used to detect and deselect defective photosensitive elements (PSEs) that most decrease the signal-to-noise ratio (SNR) of the channels in the IR FPA. This method increases the SNR in the channels of the IR FPA, which increases the ability of the IR FPA to detect low-power optical signals in the infrared range. This result is ensured by the fact that the detection of defective PSEs is achieved by processing signals and noises of all PSEs using the criterion for detecting PSEs that most reduce the SNR in the channels of an IR FPA. This method is a common principle for detecting defective PSEs, because the criterion analyses the influence of all PSEs on the SNR in the channels of an IR FPA, including the overly noisy elements.

Keywords: photoelectronics, optoelectronic devices, infrared range, focal-plane array, time delay integration, noise, deselection, signal-to-noise ratio, photosensitive elements

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