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AN ANALYSIS REGARDING THE DECREASING OF THE IMAGE QUALITY WITH THE OPTICAL MISALIGNMENT

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Rezumat. *Performantele de informație vizuala achiziționate de o camera termala sunt determinate de doi parametri distincți, NETD (Noise equivalent temperature difference) si MTF (Modulation Transfer Function); valoarea fiecăruia dintre acești parametri este dependentă de caracteristicile si de metodologia de măsurare a componentelor de bază ale unei camere termale: obiectivul și matricea de detecție. Autorii analizează unele probleme legate de măsurarea NETD și a MTF în cazul în care variază distanța focală a obiectivului și apare o dezaliniere optică la montajul camerei termale. Experimentele realizate demonstrează că o distanță focală mai mare asigură un MTF mai bun, iar evaluarea NETD cu instrumentar electronic este mai adecvată.*

Abstract. *The performances of visual information acquired with a thermal camera are determined by two distinct parameters, NETD (Noise equivalent temperature difference) and MTF (Modulation Transfer Function) values of each of these parameters is dependent on the characteristics and the methodology for measuring the basic components of thermal camera: the lens and the starring detector. The authors analyze some problems related to measurement NETD and MTF where the focal lens is variable and optical misalignment occurs when mounting thermal camera. Experiments demonstrate that a longer focal distance provides a better MTF and NETD evaluation with electronic instruments is most appropriate.*

Keywords: Thermal camera, NETD, MTF, optical misalignment, lens focal

1. Introduction

It is known that, in the field of actual research of vision using thermal cameras, the most frequent question refers to the performance of the distance observation, as is shown in the paper [1, 2].

This performance is described by some main parameters, as Noise Equivalent Temperature Difference (NETD), Modulation Transfer Function (MTF), and Minimum Resolvable Temperature Difference (MRTD) [3].A thermal camera is commonly composed of an optical assembly, a FPA detector module (starring detector), and signal processing electronics.

The imaging process can be described as a functional flow diagram (fig. 1.) from scene (input information) to observer (output information).

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