

Abstract Submitted
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Absolute Temperature Calculation Using a Multispectral Thermal Infrared Camera and n-Color TES Image Processing BENJAMIN SAUTE, ALEXANDRINE HUOT, Telops, SERGE-OLIVIER-ADAM GNES-SOUGOU, Universite Laval, MARTIN LARIVIERE-BASTIEN, Telops — Two-color pyrometry is a non-contact point temperature measurement technique that utilizes two distinct, closely-spaced narrowband filters to collect radiance measurements. The ratio of these radiance measurements is then used to compute the absolute temperature of the object without requiring prior knowledge of the material emissivity. Telops is developing an algorithm called n-color TES that extends two-color pyrometry principles to generate absolute temperature maps from multispectral thermal infrared imaging data. Processed image quality is highly dependent upon the use of appropriate spectral filters, with best results being observed from the use of two narrow, closely-spaced wavebands with no overlap in spectral range. Telops is working to extend this algorithm by incorporating radiance data from n -wavebands (up to 8) in order to optimize the accuracy of the absolute temperature values generated for each pixel. In this work, the Telops MS-M100k was used to collect in-band radiance (IBR) measurements on a flame-heated steel plate for use in n-color TES calculations. The MS-M100k is equipped with a fast-rotating filter wheel capable of 6000 rpm rotation which, when synchronized with camera acquisition, allows for collection of 8-channel thermal imagery at 100 fps per channel. The multispectral thermal images and n-color TES images are presented along with a discussion on initial attempts to characterize the accuracy of temperature values generated by n-color TES.

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