

Abstract Submitted
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Multi-Wavelength Optical Pyrometry Investigation for Turbine Engine Applications. JORDI ESTEVADEORDAL, NIRM NIRMALAN, GUANGHUA WANG, GE Global Research, THERMAL SYSTEMS TEAM — An investigation of optical Pyrometry using multiple wavelengths and its application to turbine engine is presented. Current turbine engine Pyrometers are typically broadband Si-detector line-of-sight (LOS) systems. They identify hot spots and spall areas in blades and bucket passages by detection of bursts of higher voltage signals. However, the single color signal can be misleading for estimating temperature and emissivity variations in these bursts. Results of the radiant temperature, multi-color temperature and apparent emissivity are presented for turbine engine applications. For example, the results indicate that spall regions can be characterized using multi-wavelength techniques by showing that the temperature typically drops and the emissivity increases and that differentiates from the emissivity of the normal regions. Burst signals are analyzed with multicolor algorithms and changes in the LOS hot-gas-path properties and in the suction side, trailing edge, pressure side, fillet and platform surfaces characterized.

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