

## Dual-band active thermography on infrared transparent materials

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### Abstract

Infrared semi-transparent materials, like zirconia thermal barrier coatings on steel, CFRP, wood and human skin were investigated by flash excited pulsed and laser excited lock-in thermography. The experiments are performed using an infrared dual-band camera working simultaneously in the 4.4-5.2  $\mu\text{m}$  and in the 7.8-8.8  $\mu\text{m}$  bands. Spectral band dependent cooling slopes and phase shifts are observed. For the pulsed domain, a theoretical model was set up to describe the thermal radiation decay curves of infrared transparent coatings on opaque substrates. The results are in good agreement with the experiment. Experiments show that, like in transient infrared emission spectroscopy, spectral features of the material surface regions are pronounced shortly after excitation.

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