

Abstract Submitted
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Simultaneous Reference- and Signal-Imaging for Cancellation of Unsteady Motion in Pressure-Sensitive Paint Measurement KENSUKE MIYAMOTO, TAKESHI MIYAZAKI, The University of Electro-Communications, HIROTAKA SAKAUE, JAXA — Simultaneous reference- and signal-image acquisition for pressure-sensitive paint (PSP) measurement is presented in this paper. The system to acquire these images consists of a two-color PSP and a high-speed CCD camera. The two-color PSP provides a reference and a signal luminescence separated by their luminescent peak wavelengths of 520 nm and 620 nm, respectively. The reference luminescent image is acquired through a green filtered CCD, while the signal image through a red filtered CCD. This system can cancel a non-uniform illumination for exciting two-color PSP as well as a non-uniform image acquisition of a CCD camera due to the location between the camera and the testing object. This system can be applied to a PSP measurement, which includes translation, vibration, and deformation of the testing object. Our measurement system is thus advantage from a conventional PSP measurement, which requires stationary location among the testing object, camera, and illumination source. Unsteady motion of a plate coated with our two-color PSP is included as a demonstration. The developed system captured the unsteady motion as well as gas impingement on the coated plate with camera frame rate of 300 Hz.

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