

Abstract Submitted
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**Lifetime Characterization of Electro-Luminescence Based
Pressure-Sensitive Paint System for Unsteady Flow Field Measurements**

YOSHIMI IJIMA, HIROTAKA SAKAUE, JAXA — Electro-luminescence based pressure-sensitive paint (EL-PSP) system uses an EL as an illumination source for a PSP measurement. EL can be directly applied onto a PSP model to eliminate a remote illumination. This gives a uniform illumination on a PSP model without moving/re-directing the illumination. The temperature dependency can be reduced by the opposite temperature dependency of the EL and PSP. At present, the system is demonstrated in a steady flow field. To extend the system for capturing an unsteady flow field, a fast responding PSP and the lifetime characterization of the system are required. The former can be achieved by using a porous PSP. The latter is discussed in the present presentation. The EL-PSP system needs an AC input to illuminate the EL, which gives a pulsed/periodic excitation to a PSP. This limits the acquisition timing of the flow field; a frequent timing can resolve a fast unsteady flow field. The lifetime of the PSP emission can be related to the pressure. The lifetime decays of the EL and PSP are measured to discuss the lifetime characterization of the system.

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