

## **Measurement of thermal parameter using non-contact photopyroelectric method**

### **Abstract**

In the standard photopyroelectric technique, a precise control of thermal coupling fluid between the solid sample and the sensor is sometimes difficult, and yet an important factor in sample characterization. In this paper, we propose a non-contact photopyroelectric configuration for thermal diffusivity measurement of solids by considering the phenomena of thermal wave interference. We adopted the thermal wave interferometry, which was extensively discussed by Bennett and Patty in the photoacoustic signal generation, to our photopyroelectric signal generation in a thermally thick condition for a nondestructive testing. A normalization procedure has been used to eliminate a number of media parameters of photopyroelectric cell that otherwise needed to be known before one can determine thermal diffusivity of the sample. The thermal diffusivities obtained for Al, Cu, and Ni samples were close to literature values and thus justified the proposed model.

**Keyword:** Photopyroelectric; Thermal diffusivity; Thermal wave