

The International Pilot Comparison of Laser Flash Thermal Diffusivity Measurements

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A pilot study of the laser flash method, which was piloted by NMIJ, was organized by the working group 9 (WG9) of the Consultant Committee of Thermometry (CCT). The objective of this pilot study was to know the state-of art of thermal diffusivity measurements by the laser flash method and to find common understanding about measurement procedure, data analysis procedure, and evaluation of uncertainty in thermal diffusivity measurements. Four National Measurement Institutes (NMIs) participated and completed measurements of the isotropic graphite and the Armco iron specimens from room temperature to 1000 K. In this pilot comparison, we try to estimate the inherent thermal diffusivity using the extrapolating procedure in a plot of measured apparent thermal diffusivity values vs. the amplitude of output signal corresponding to the temperature rise during each measurement. The laser flash equipment for this comparison consisted of original apparatus(es) and commercial apparatus(es). The results were observed to demonstrate a good agreement of not very large variation.