Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Development of Dual Luminescence Imaging for Capturing the Temperature Distribution of Supercooled-Water Droplets AKIHITO AOKI, SHIGEO KIMURA, Kanagawa Institute of Technology, KATSUAKI MORITA, University of Tokyo, HIROTAKA SAKAUE, Japan Aerospace Exploration Agency — Dual luminescent imaging technique is developed to capture the temperature field of supercooled-water droplets. This technique can be applied to obtain the temperature information for the icing in flights, power cables, architectures, and etc. It consists of two luminophores in water solution; one is sensitive to the temperature and the other is insensitive to the temperature. The former is used as a signal luminescence, and the other as a reference luminescence. Both are spectrally separated, which are captured by a hi-speed color camera. The temperature calibration in water below freezing point is shown. As a demonstration, the temperature field of a supercooled droplet on a plate with a different temperature is shown.

Akihito Aoki
Kanagawa Institute of Technology

Date submitted: 02 Aug 2011 Electronic form version 1.4