

Abstract Submitted  
for the DFD07 Meeting of  
The American Physical Society

**Transient temperature measurements of single water droplets over rough surfaces** DE HUANG, HUI HU, Aerospace Engineering Dept., Iowa State University, CHIEN-PEI MAO, Ideal Sprays, Inc. — Advancing the technology for safe and efficient aircraft operation in atmospheric icing conditions requires a better understanding of the micro-physical phenomena associated with the accretion and growth of ice and the attendant aerodynamic effects. In order to elucidate the underlying physics associated with aircraft icing, experimental techniques capable of providing accurate measurements to quantify important ice growth physical processes such as dynamics of water droplets and transit heat transfer inside water droplets over rough surfaces are highly desirable. In the present study, we present the research progress made in our recent effort to develop and implement a novel molecular tagging thermometry (MTT) technique for the transient temperature measurements of water droplets over rough surfaces to quantify the unsteady heat transfer process inside convectively cooled/heated water droplets in order to improve our understanding about icing physics for various aircraft icing applications.

Hui Hu  
Aerospace Engineering Dept., Iowa State University

Date submitted: 22 Jul 2007

Electronic form version 1.4