

Abstract Submitted  
for the DFD17 Meeting of  
The American Physical Society

**Study on bouncing motion of a water drop collision on superhydrophobic surface under icing conditions** TETSURO MAEDA, Kanagawa Institute of Technology, KATSUAKI MORITA, Japan Aerospace Exploration Agency, SHIGEO KIMURA, Kanagawa Institute of Technology — When micro droplets in the air are supercooled and collide with the object, they froze on the surface at the time of a collision and can be defined as icing. If supercooled water droplets collide with an airfoil of an aircraft in flight and shape changes, there is a danger of losing lift and falling. Recently, the ice protection system using a heater and Anti-/ De-icing (superhydrophobic) coating is focused. In this system, colliding water droplets are melted by the heat of the heater at the tip of the blade, and the water droplet is bounced by the aerodynamic force on the rear superhydrophobic coating. Thus, it prevents the phenomenon of icing again at the back of the wing (runback ice). Therefore, it is possible to suppress power consumption of the electric heater. In that system, it is important to withdraw water droplets at an extremely superhydrophobic surface at an early stage. However, research on bouncing phenomenon on superhydrophobic surface under icing conditions are not done much now. Therefore, in our research, we focus on one drop supercooled water droplet that collides with the superhydrophobic surface in the icing phenomenon, and aim to follow that phenomenon. In this report, the contact time is defined as the time from collision of a water droplet to bouncing from the superhydrophobic surface, and various parameters (temperature, speed, and diameter) on water droplets under icing conditions are set as the water drop bouncing time (contact time) of the product.

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Date submitted: 01 Aug 2017

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