

Abstract Submitted
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High speed imaging in icing windtunnel tests DENNIS DE PAUW, PERCIVAL GRAHAM, ALI DOLATABADI, Concordia University — The detailed visualization and behavior of a spray impinging on a hydrophilic, and superhydrophobic aerodynamic shape in isothermal room and icing conditions can provide deep understanding of in-flight icing. A superhydrophobic coating has a very low surface energy so it can be used to counteract the ice accumulation. It also reduces the adhesion strength of ice to the surface which ensures easier removal of the ice during flight. The focus of the experiments primarily lies on the fundamental study of multiple droplet, i.e. spray, impact on a NACA 0012 airfoil in room and icing conditions. Under such conditions, important icing features such as rivulets and runback flow are observed. This provides us with the basics of ice formation on an aerodynamic surface. The study also focuses on the comparison between aluminum and superhydrophobic surfaces for ice accumulation in conditions which approach flight conditions. All the experiments are carried out in a small scale icing windtunnel using high speed photography with frame rates ranging from five thousand to fifty thousand frames per second.

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