Electrostatic De-icing Method

VTIP 21-037: “Electrostatic De-icing”

THE CHALLENGE

The productivity of vehicles, infrastructure and heat pumps can all be hindered by the presence of ice. Flights can be delayed, bridges freeze over, and everyday people have to inconveniently wait for cars to heat up or scrape the ice off themselves. Finding new ways to quickly remove ice would not only free up time, but also save money that would have been lost due to the situations previously listed.

Plane undergoing de-icing using currently available methods. (Obtained from StormGeo)

OUR SOLUTION

Researchers at Virginia Tech have developed a new method of removing ice using an electrostatic approach. When ice grows on a surface, it becomes spontaneously electrified. By applying voltage to an object held above the electrified ice, an attractive electrostatic force is exerted on the ice. This causes the ice to be ripped from the surface and launched into the air. This method can be applied to various surfaces vulnerable to ice buildup and make the removal process quick and effective.

Visualization of ice being ripped from the surface after exposure to a charged object.

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