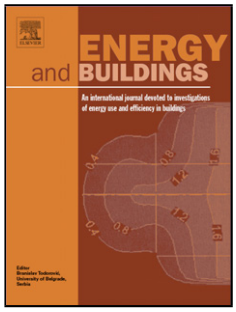

Title: Recent progress on ultrasonic de-icing technique used for wind power generation, high-voltage transmission line and aircraft

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Recent progress on ultrasonic de-icing technique used for wind power generation, high-voltage transmission line and aircraft

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Highlights

- Ant-icing/de-icing techniques for wind turbine blade is summarized
- De-icing techniques for high-voltage transmission line is summarized
- Recent progress on ultrasonic de-icing technique for wind turbines is summarized
- Recent progress on ultrasonic de-icing technique for high-voltage line is summarized
- Recent progress on ultrasonic de-icing technique for aircraft is summarized

Abstract: Ice on wind turbine blades, high-voltage transmission line and aircraft wing is a serous problem in winter, which causes much losses of energy. There is always a strong demand for de-icing techniques that are effective, low in energy consumption, lower cost and reliable operation. Ultrasonic de-icing, as an new de-icing technique, attracts more attention due to its energy-saving, simplicity, lower expenses, good applicability and no pollution produced to environment. In this paper, recent progress on ultrasonic de-icing technique is summarized in view of wind turbine blade de-icing, high-voltage transmission line de-icing and aircraft wing de-icing. In particular, a plier-shaped device invented by a college student in China for high voltage transmission line ultrasonic de-icing is introduced. This device has won China national patent and been effectively put into practical use. Finally, the miniaturization of ultrasonic generator is proposed. The purpose of this paper is to provide theoretic and experimental support for the widespread application of ultrasonic de-icing technique.

Keywords: wind turbine blade de-icing; ultrasonic high-voltage transmission line de-icing; aircraft wing de-icing

1.Introduction

The losses of energy caused by ice on wind turbine blades, high-voltage transmission line and aircraft wing are too much. Therefore, there is always a strong quest for de-icing techniques that are lightweight, and at