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基于红外光谱吸收的结冰速率传感器设计(PDF)

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Title: Icing Velocity Sensor Based on Infrared Spectrum Absorption

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关键词: 红外光谱吸收; 朗伯-比尔定律; 结冰速率传感器; 光源驱动电路; 光电检测电路

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摘要: 结冰速率传感器是保证飞机在结冰气象条件下安全飞行的重要部件。基于红外光谱吸收的结冰速率传感器较其他型式的精度更高。对红外结冰速率传感器进行研究,推导了双波长对比吸收测量冰厚的理论模型。设计了一种采用对光源驱动电路进行脉冲调制驱动双光源的红外结冰速率传感器。提出了其关键技术并给出了解决方案。研究内容为红外结冰速率传感器的实际应用提供了参考依据。

Abstract: Icing velocity sensor is an important component to protect aircraft flight under icing conditions. The icing velocity sensor based on infrared spectrum absorption is more precise than others and was studied in this paper. The theoretical model of ice thickness measurement using double contrast wavelength absorption method was deduced. An icing velocity sensor based on the infrared spectrum absorption was designed, in which two

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infrared laser diodes driven by pulse circuit were used. The key technologies of the icing velocity sensor based on infrared spectrum absorption were proposed, along with solutions. The