

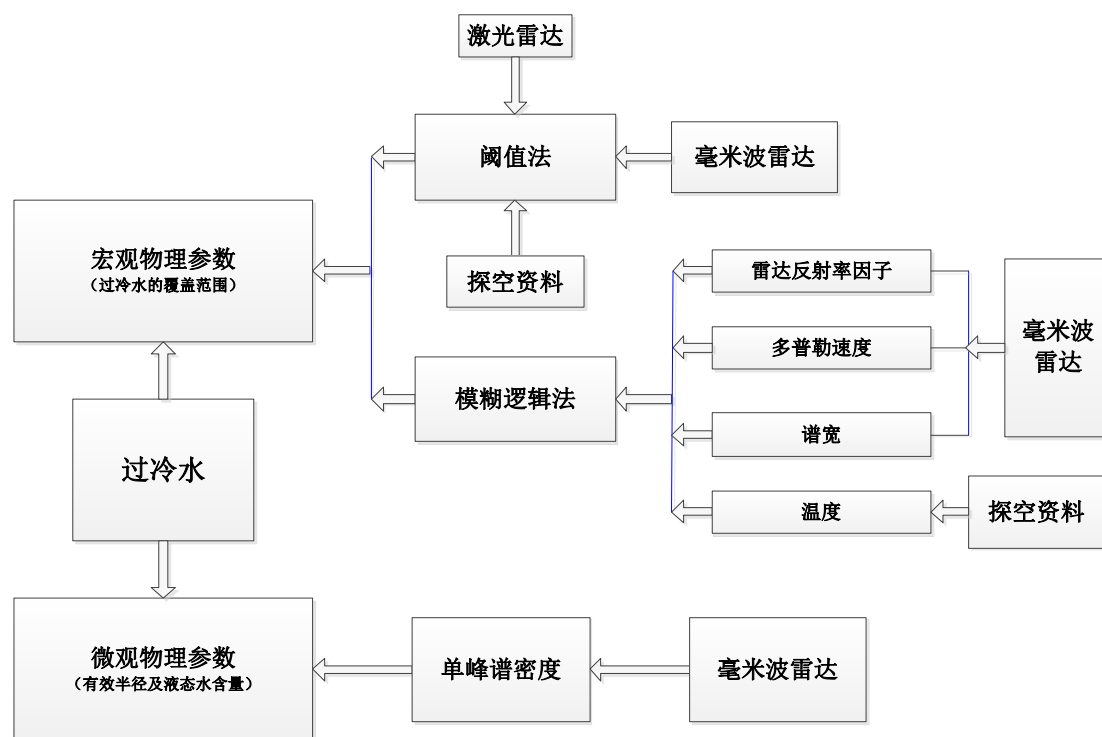
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中文题目：基于毫米波云雷达的飞机结冰预警算法研究

作者：王金虎\*, 葛俊祥, 张其林, 范盼, 等

中文摘要：为了避免飞机发生结冰的事故，研究了过冷水的识别算法。利用阈值法对毫米波雷达、激光雷达以及探空温度的数据分析以反演过冷水的覆盖区域，利用模糊逻辑算法对观测目标进行分类，对比以上两种方法的结果得到过冷水的宏观物理参数。为了研究混合相态中过冷水的微观物理特性，提出利用毫米波雷达的功率谱密度函数分离得到混合相态中过冷水层的单峰谱密度函数，利用过冷水的单峰谱密度函数反演得到过冷水的有效半径以及液态水含量信息，其识别的结果为飞机的起飞、飞行以及降落过程中预警过冷水区域提供了可靠的数据支持。

文章结构框图：



英文题目：Study of Aircraft Icing Warning Algorithm Based on Millimeter Wave Radar

作者：WANG Jinhui\*, GE Junxiang, ZHANG Qilin, FAN Pan, et al.

英文摘要：In order to avoid accidents due to aircraft icing, an algorithm for identifying supercooled water was studied. Specifically, a threshold method based on millimeter wave radar, lidar, and radiosonde was used to retrieve the coverage area of supercooled water and a fuzzy

logic algorithm was used to classify the observed meteorological targets. The macrophysical characteristics of supercooled water could be accurately identified by combining the threshold method with the fuzzy logic algorithm. In order to acquire microphysical characteristics of supercooled water in a mixed phase, the unimodal spectral distribution of supercooled water was extracted from a bimodal or trimodal spectral distribution of a mixed phase cloud, which was used to retrieve the effective radius and liquid water content of supercooled water using an empirical formula. These retrieved macro- and microphysical characteristics of supercooled water can be used to guide aircrafts during takeoff, flight, and landing to avoid dangerous areas.

