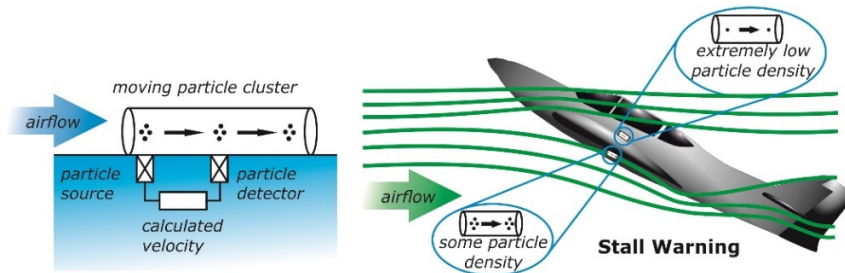


RWTH Technology

Particle anemometer to measure air speed and warn of potential stall for aircraft



Challenge

For the safe and effective piloting of aircraft, many sensors are currently used to measure the speed, altitude, along with a wide array of other parameters. Many of these sensors are old technologies that have well known technical problems. Most significant is the Pitot tube, from which the airplane speed is measured by a change in pressure induced by air fluid entering the tube. The problem exists, however, that a change in temperature can change the pressure, resulting in a large error. Other problems exist when, for example, the tube is blocked either by ice, dust, or other artifacts which can occur both on the ground and during flight.

Solution

The invention consists in a novel device to measure critical aeronautical parameters, mainly of which is the true air speed. This not only gives a more accurate measure of the aircraft velocity but depending on device placement can provide further applications such as stall indicator and autopilot correction.

Our device consists of a source of particles that stream over the surface of the aircraft and a detector that measures their arrival time along with the air fluid density (indicated by the signal strength at the detector compared with the source). A local computer then extracts the air speed and can relay the parameters directly to the pilots or to other systems (e.g. autopilot). When measured on the fuselage, the device gives the airplane velocity. When measured both above and below a wing, the lift and air fluid density can be measured and warn of potential stall when the density or difference is too low.

Lift, which maintains an aircraft in the air, is generated by having more air pressure below a wing or rotor than above it. By having a direct measure of the airspeed and air density, the lift could be measured in flight. Even though lift may be the most important value for flight, no sensor until now has a means of characterizing how much lift is generated. This provides the application of warning the pilots of a potential stall by providing the correct information and how to properly react.

Advantages

- Measurement of the real airspeed
- Can bring safety, accuracy and improved fuel economy to the field of aviation and other markets, such as consumer electronics and high-performance automotive

Status

- International patent application at the European Patent Office
- Currently applying for EXIST grant to develop prototype

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Fields of application

Aviation (sensors, avionics, fuel economy),
Consumer electronics,
Automotive (fuel economy)

Keywords

#Airspeed, #velocity,
#stall warning, #fuel economy,
#green technology, #autopilot,
#aircraft, #airplane, #helicopters,
#drones, #sensors, #anemometer,
#Pitot tube

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