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# Master thesis/ADP



## “Ice thickness measurements of supercooled water droplets impacting onto rotating surfaces”



Due to the escalating extreme weather conditions, the aircraft icing events are increasingly growing. The analysis of this phenomenon has gained increased attention, particularly in the field of aviation safety. A significant contributor to icing is the occurrence of Supercooled Large Droplets (SLD), water droplets suspended in air at temperatures below freezing one. Previous experiments in the scientific community have predominantly focused on the normal impact of these droplets on solid surfaces with low velocities.

Our new research aims to expand this understanding by considering rotating surfaces and high relative impact velocities. This approach will closely simulate real-world conditions that an aircraft wing's experience.



*quora.com*

The project consist in creating a single water drop impact set-up onto a rotating disk (a similar old set-up is already present). Design either a cooling chamber, or a cooling system for the droplet or the disk. Measure and automate by means of a chromatic line sensor (CLS) the thickness of the formed ice layer on the disk

### Requirements:

- High motivation and interest in experimental work
- Teamwork-oriented with a strong sense of responsibility and consciousness
- Knowledge of **LabView/Arduino, CAD** (Siemens NX, SolidWorks, ...)  
Hands-on experience with sensors, high speed/infrared camera, image-processing (Matlab) would be beneficial

### Tasks:

- Recreate a rotating, supercooled water droplet impact experimental set-up
- Measure the residual ice thickness layer on the rotating disk
- Conduct and evaluate the experimental results

**Starting time:** as soon as possible

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