

# COLLOQUIUM

Group: Engineering Fluid Dynamics

As part of his Bachelor assignment

**Bastiaan Drenth**

will give a presentation, entitled:

## **Effects of Ice Accretion on an ATR-72 Wing**

**Date: Wednesday July 9, 2014**

**Time: 11:15**

**Room: Horst Building Room Z.105**

**Summary:**

Aircraft icing continues to be a threat for modern day aircraft. Icing occurs when supercooled large droplets (SLD's) impinge on the surface of forward-facing parts of the aircraft. These droplets can bounce off, freeze on impact or freeze partly, with the remaining liquid flowing aft along the surface. These differences in impact result in different ice shapes.

Several computer programs have been developed to predict these ice shapes. An example of such a program is 2DFOIL-ICE. The method also calculates the steady flow around the two-dimensional airfoil in order to determine the aerodynamic coefficients, i.e. the lift, drag and pitching-moment coefficient. 2DFOIL-ICE also computes the flow field around the airfoil. Subsequently 2DFOIL-ICE calculates droplet trajectories using the Lagrangian method.

In order to compare the predicted results for the two-dimensional wing to experimental results, a predicted ice shape has been fabricated and mounted on an ATR-72 wing. To determine the effects of icing on this wing, the wing with simulated ice accretion has been tested in a wind tunnel. These results have been compared with results for a clean ATR-72 wing. Finally these results have been compared to the results from 2DFOIL, in order to validate the numerical method.

**Assessment committee:**

Prof.dr.ir. H.W.M. Hoeijmakers (Chairman)  
Dr. H.K. Hemmes (External Member)  
Ir. E. Norde (mentor)

**Chairman,**

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