Wind Tunnel Tests on Ice Accretion on Wind Turbine Blades

Preparation, Set-up

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Purpose

• Study the ice build-up

• Study the effect of ice on the aerodynamics

• Study the flow around the iced blade – flow visualization

• Compare results with numerical programs and other studies
Wind Tunnel

- Climatic wind tunnel – FORCE Technology and DTU
  - Rain, ice, snow

Test set-up

- NACA 64-618 airfoil section provided by LM Wind Power
- 900 mm chord length and 1350 mm width
Test set-up

- NACA 64-618 airfoil section, provided by LM Wind Power
- 900 mm chord length and 1350 mm width
- A pair of AMTI MC5 Force transducer is also included in the set up
- Equipped with pressure taps
Test set-up - final

In the workshop
Test set-up - final

In the tunnel

Down stream

Up stream
Test set-up - final
Wind Tunnel Tests - Preparation

- Due to unexpected circumstances
  - Some velocity tests – test the set up
  - Flow visualization – with oil based smoke generator and laser
Wind Tunnel Tests – Flow Visualization
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Wind Tunnel Tests – Flow Visualization
Wind Tunnel Tests – Further Plans

- Dry test:
  - Test of the set-up both aerodynamics and pressure distribution, flow visualization

- Ice test:
  - Test of ice build up with different velocity and temperature
  - Changes of aerodynamics as a function of time and amount ice
  - Flow visualization
Thank you!

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