



VOLVO GROUP TRUCKS TECHNOLOGY
MASTER'S THESIS PROPOSAL
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PREDICTION AND MODELLING OF SNOW PACKING ON COMMERCIAL VEHICLES USING CFD SIMULATIONS

BACKGROUND

The emerging relevance of driver assistance technologies, as well as autonomous driving, brings an increased importance of well-functioning cameras and sensors. Various types of surface contamination could inhibit the performance of such components and therefore it is important to be able to confidently predict surface contamination early in projects using simulation tools. The accumulation of snow on vehicles is complicated and depend on flow structures, surface properties, snow flake size, temperatures, humidity, heat sources etc. A deep dive into the theory of snow accumulation on vehicles is therefore necessary.

AIM

By using the knowledge gathered from an extensive literature survey on the physics of snow, CFD tools should be used to define predictive models for snow accumulation on commercial vehicles.

METHOD

The thesis will encompass:

- A literature study regarding:
 - The physics of snow and how snow accumulates on vehicles
 - Snow accumulation test and simulation methods
- Simplified simulation methodologies to predict snow accumulation based on aerodynamic properties should be defined based on the acquired knowledge on snow accumulation physics
- Creation of a more complex multi-component simulation tool to fully model the accumulation of snow should be defined on a simplified truck model

The CFD simulations will be performed using the commercial software Star-CCM+. The simulation accuracy will be measured using various snow accumulation test results.

ABOUT THE THESIS

The thesis will be carried out at Volvo's office in Lundby, Gothenburg. It will be performed during the spring of 2021 by one or two students and covers 30 ECTS per student. The thesis worker will be part of the Cab Analysis group, which works in different domains with skills in durability, NVH, aerodynamics, soiling, structural crashworthiness and occupant simulations. This group is part of the Cab development section, responsible for developing new advanced cabs for our future trucks while also continually adapting our current products to different market demands. We work as a global team with the different Volvo sites around the world.

The position will soon be available at volvogroup.com. For further information, please contact:
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