CFD analysis of trailer-truck with and without v-spoiler

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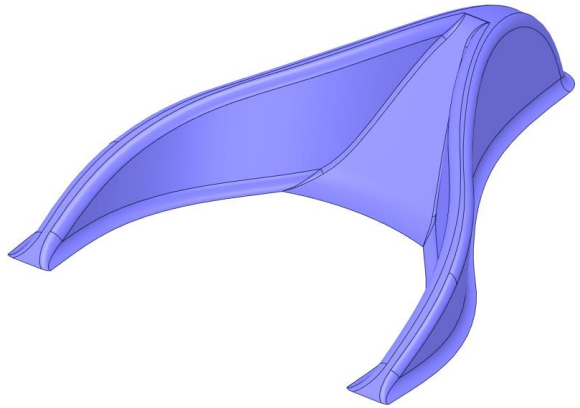
Extra Outline

- Analysis settings - assumptions
- Results



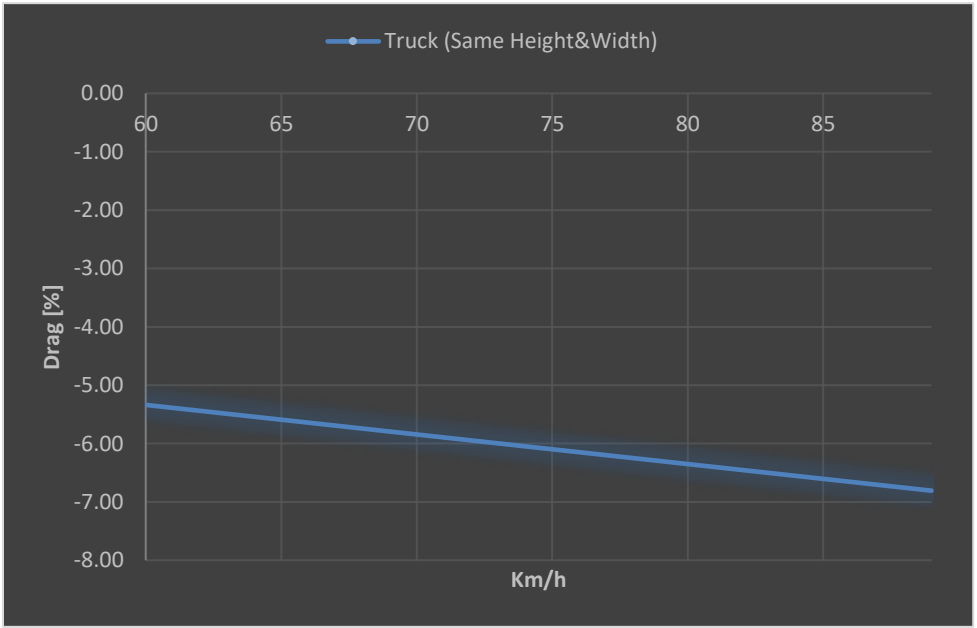
Analysis settings – assumptions

- Steady state calculations
  - 60 km/h and 89 km/h
- Important assumptions
  - Turbulence modeled!
  - No rotation of wheels
  - Constant inlet velocity
  - Yaw angle=0

Calculation	Steady state
Turbulence model	k-w BSL (curvature correction) + GEKO (curvature correction)
Fluid	Air incompressible
Pressure-vel coupling	Coupled
Spatial discretization	Presto!
Turbulence and momentum	Second order
Relaxation factors	Default
Initialization	FMG-initialization

Results - drag

- The blue line shows the drag DECREASE with V-spoiler placed on the Truck.
  - At 60 km/h the drag decrease is 5.35%
  - At 89 km/h the drag decrease is 6.8%

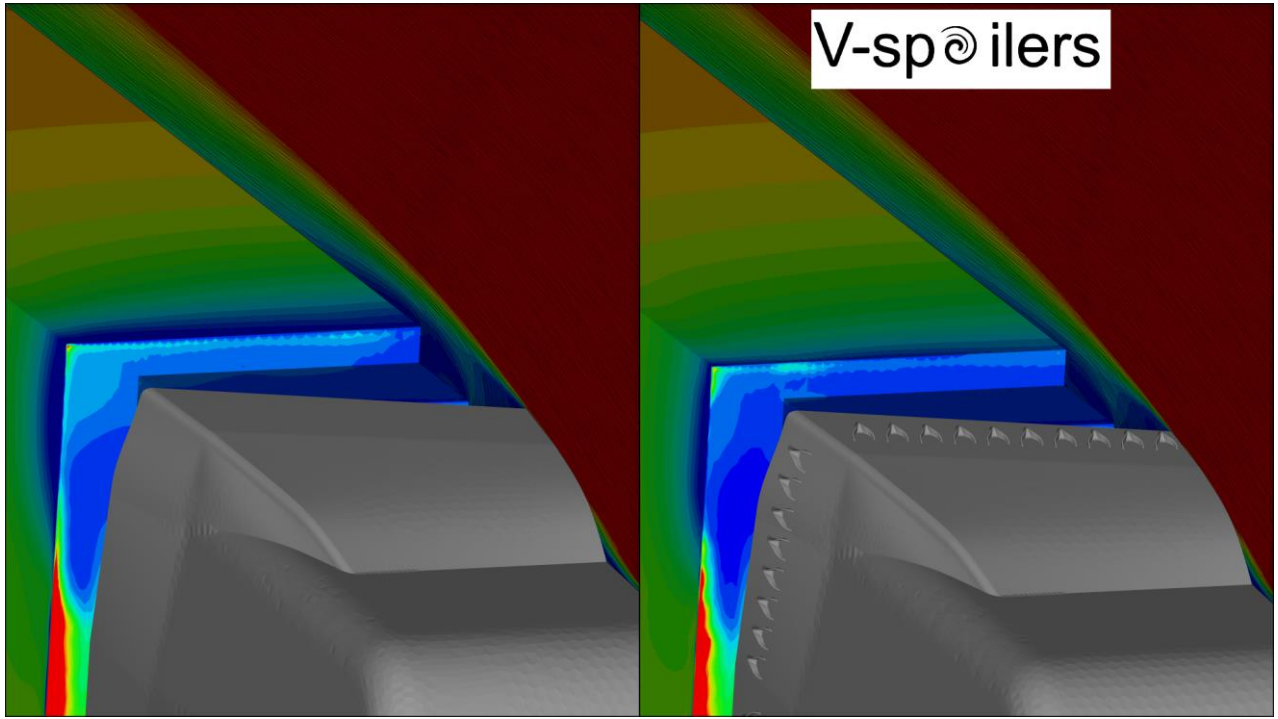


Results - downforce

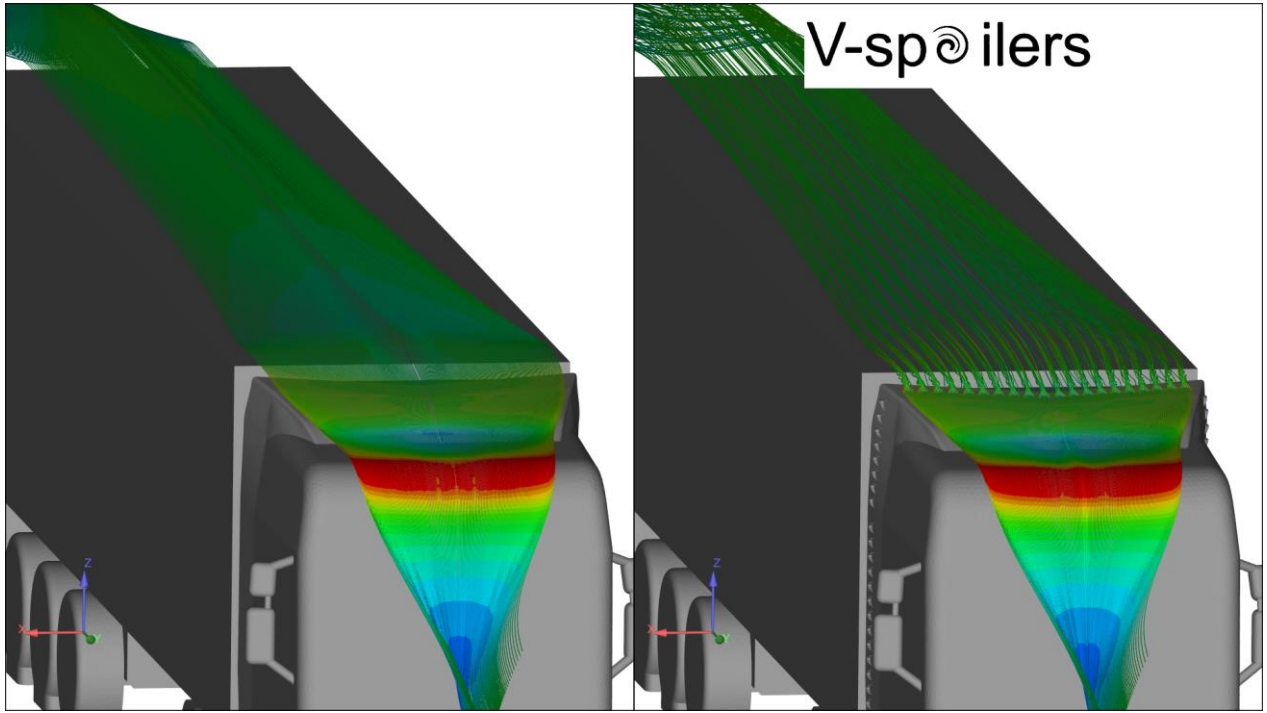
- The blue line shows the downforce INCREASE with V-spoiler placed on the truck.
  - At 60 km/h the downforce increase is 20.3%
  - At 89 km/h the downforce increase is 24.1%

Results – streamlines focused on lower part

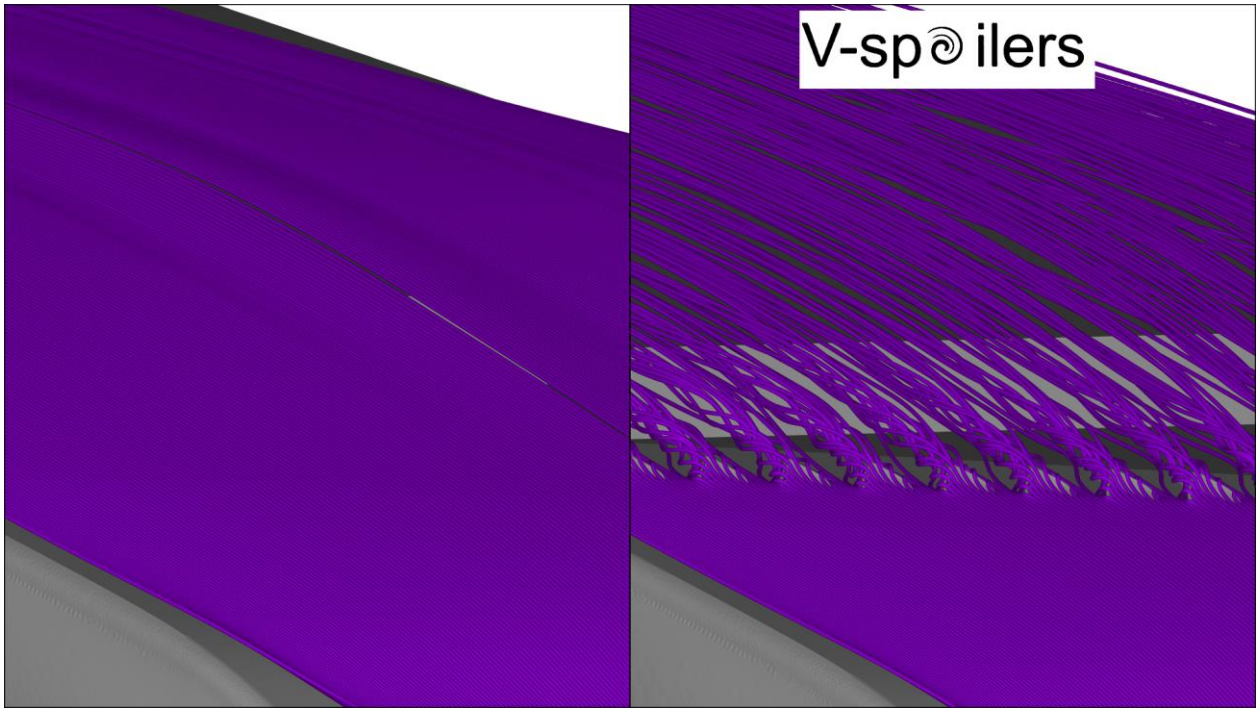
Results – pressure on trailer and velocity contour on midplane with streamlines



Results – Streamlines focused on top



Results – Streamlines focused on top zoom



Conclusion

- By placing V-spoilers on the truck significant drag reduction is achieved of 5-7%
- Also a significant downforce increase 20-25%.