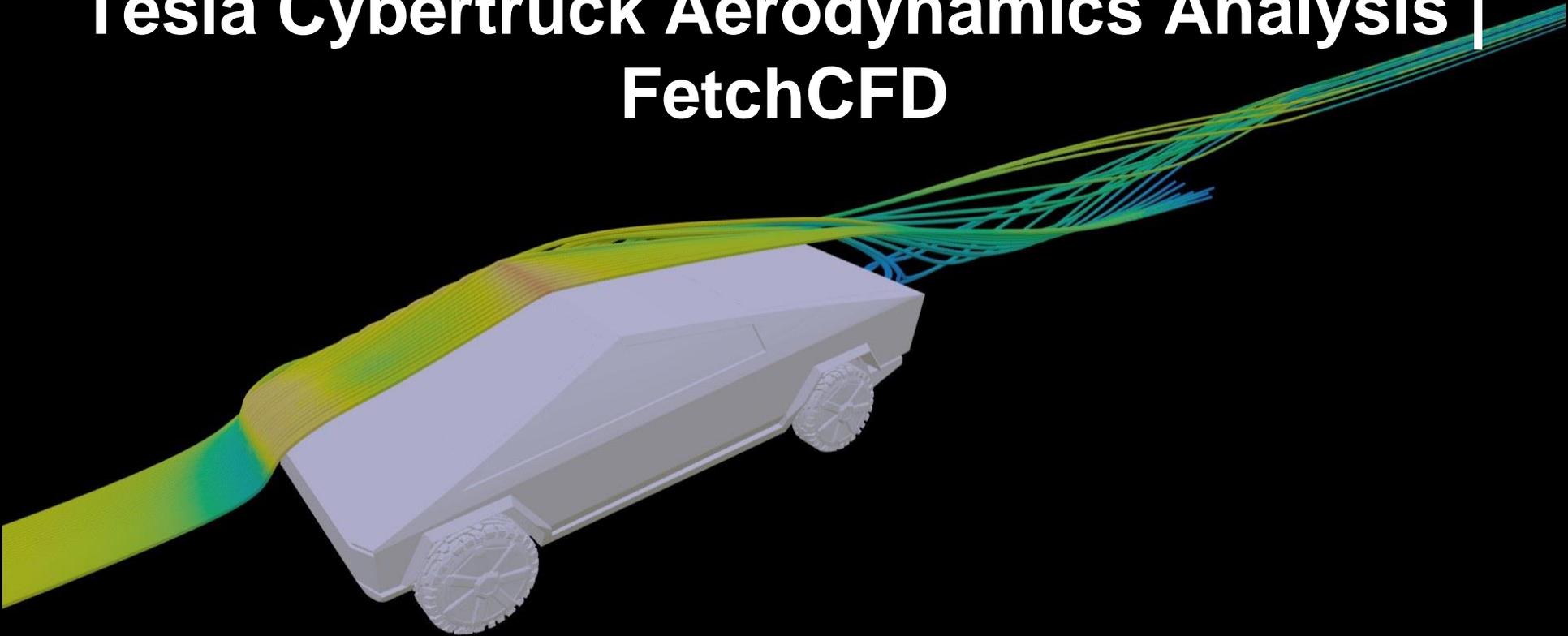


Tesla Cybertruck Aerodynamics Analysis | FetchCFD



Atif Masood

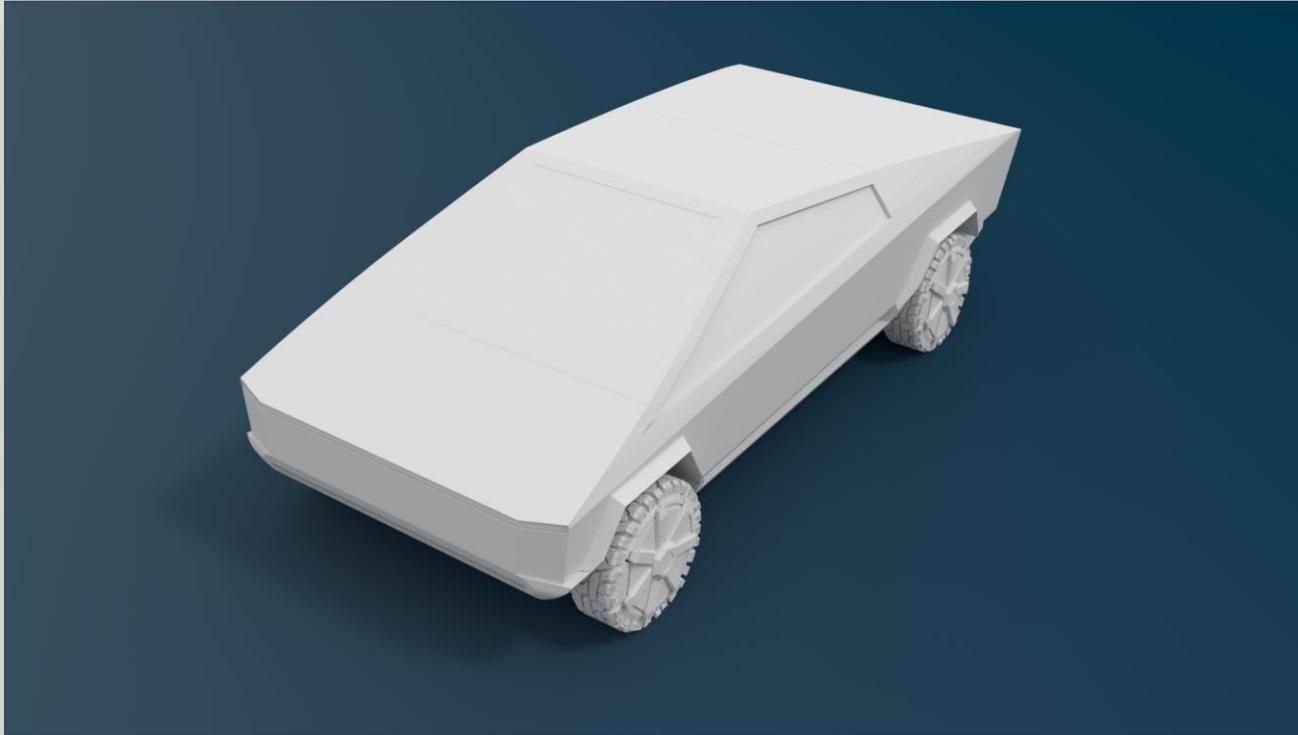
Tesla Cybertruck Aerodynamics Analysis

Aerodynamics is important for electric vehicles and Cybertruck's wedge design makes it a curious case of aerodynamics. Therefore it was interesting to see how aerodynamics of Tesla Cybertruck look like.

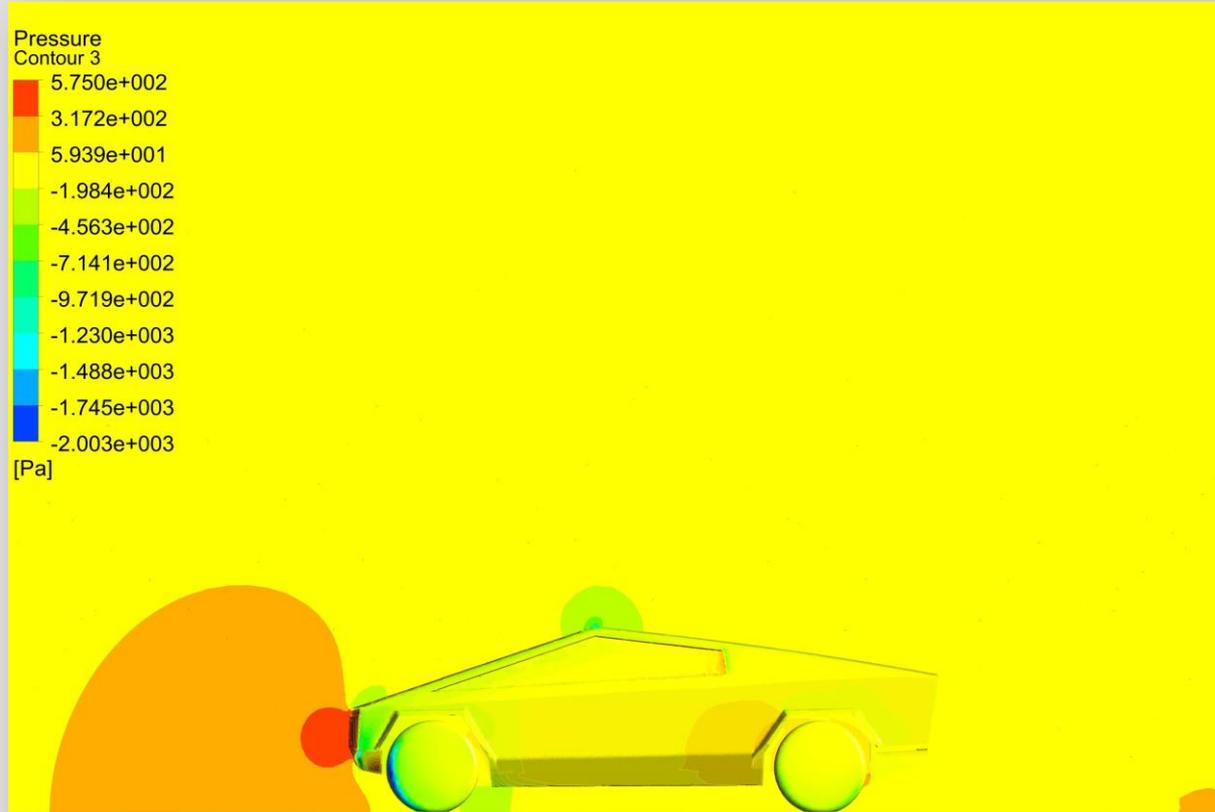
The boxy shape of the Cybertruck has no curves, just straight lines with the front of the Cybertruck inclined upward to a point just above the front-seat headrests, where it intersects with an even longer slant down to the rear.

In this analysis air velocity is set at 108 kph or 67 mph.

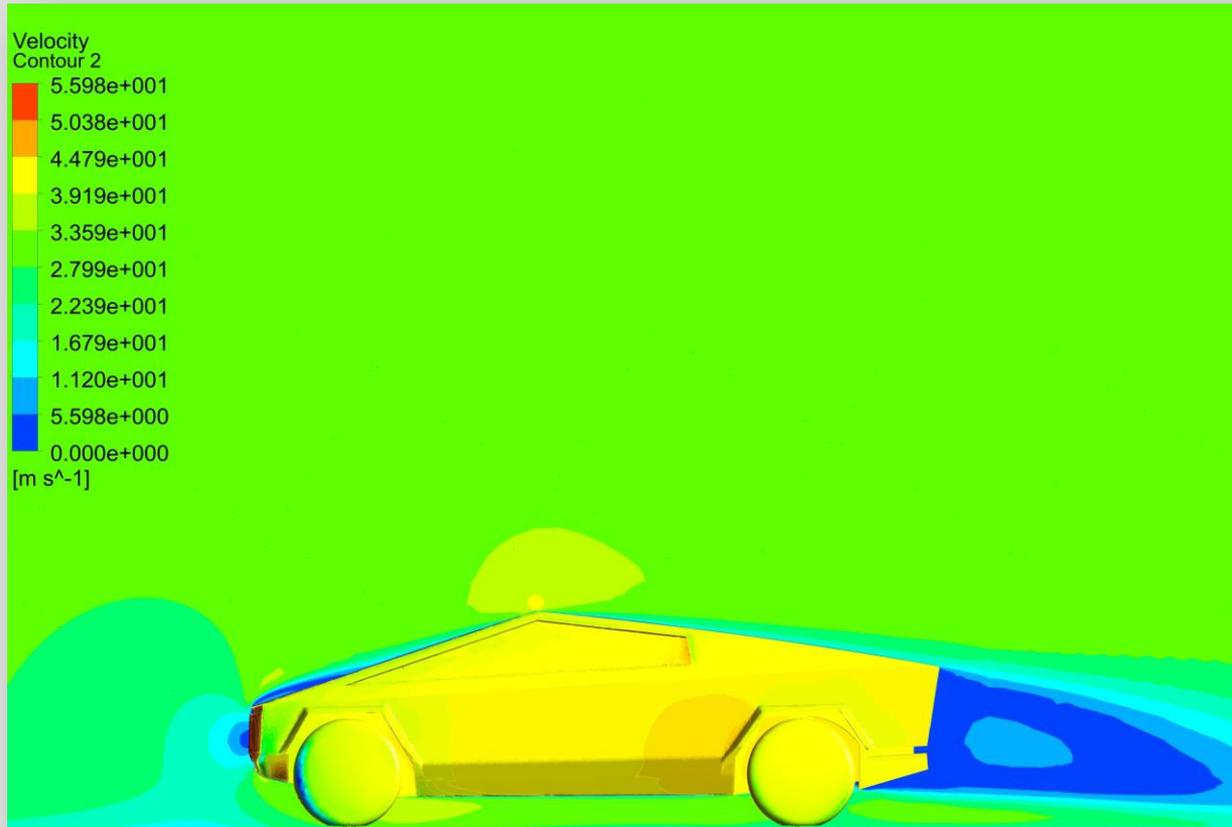
3D CAD model of the Tesla's Cybertruck.



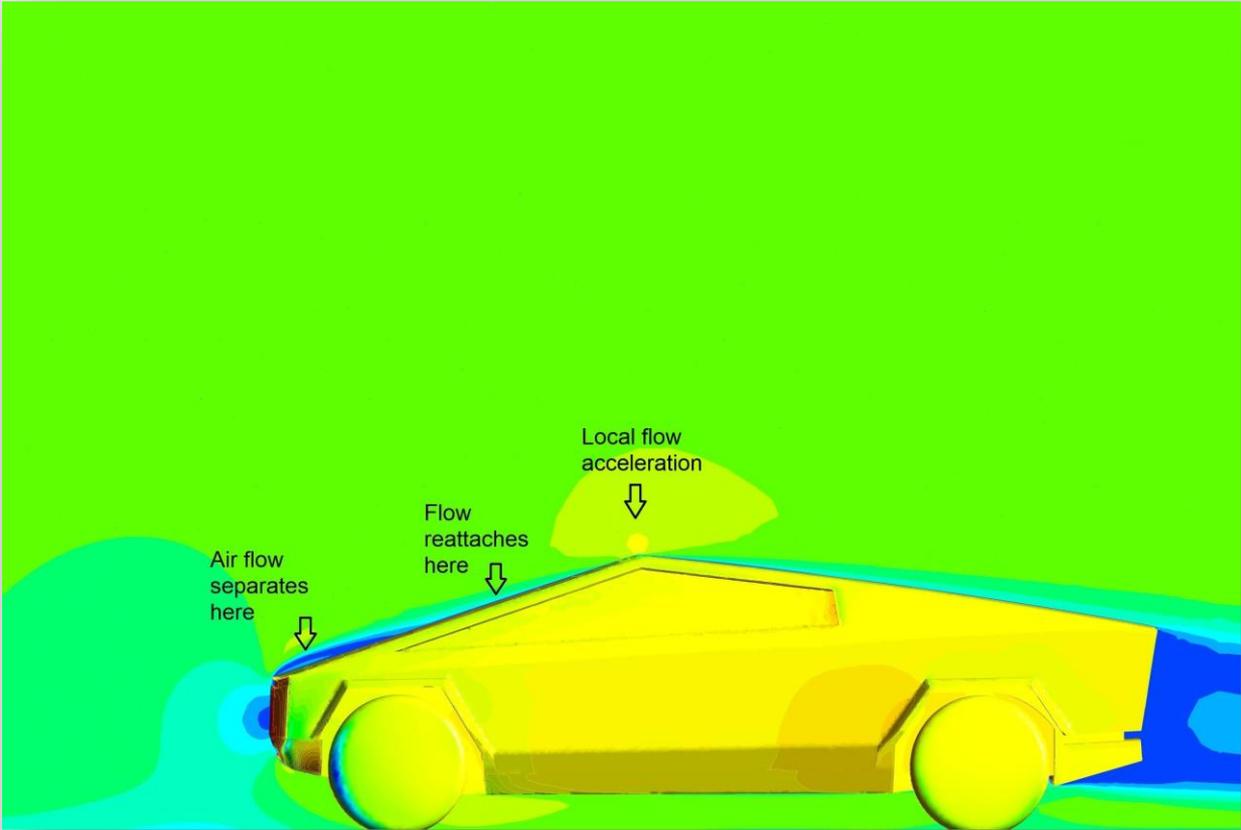
Pressure contour plotted at the mid plane reveals that at the front of the truck air is pushed away leading to a high pressure zone and creating drag.



Velocity contour plotted at the center shows flow separation happening at the front but shortly after flow reattaches itself.



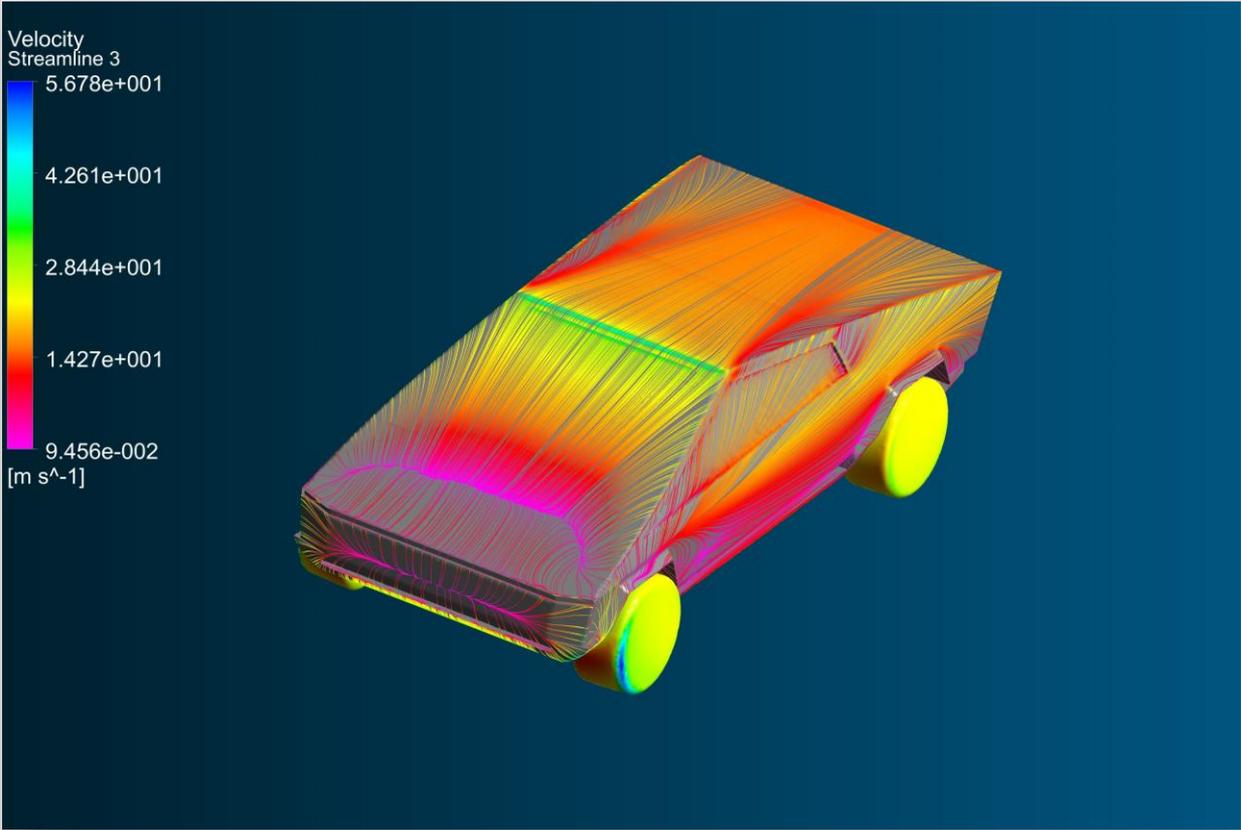
Zoomed in snapshot of the velocity contour showing local flow effects occurring around the truck.



This balances out the local effects occurring at the front half of the truck. On the other hand, back of the truck i.e. just behind the closed bed is where most of the turbulence can be observed which is expected though (as often observed in most of the trucks).

However streamlines plotted on the surface of the truck shows that part of the air slips around the edges (between front and side windshield) of the truck, thus creating reverse or circular air flow and hence creating vortices which ultimately create drag on the truck.

Velocity streamlines showing air velocity at the Cybertruck surface.



Isosurface showing velocity invariant Q at the Cybertruck surface.



The wheels are simplified for CFD analysis and are not realistically represented. They will most probably have an impact on the vortex generation and aerodynamics.

This is a quick & dirty analysis based on an approximate 3D model therefore these results can be considered as qualitative rather than quantitative. A more accurate analysis can be done based on more realistic 3D model.

Simulation and 3D model files of this analysis can be downloaded for free from FetchCFD (download links on next slide).

3D CAD model can be downloaded for free here:

[Tesla Cybertruck 3D CAD Model for Aerodynamics Study](#)



Simulation file can be downloaded for free here:

[Tesla Cybertruck Aerodynamics Analysis](#)



That's All,
Thanks
