Rocket Propelled Wind Tunnel

Design Goals

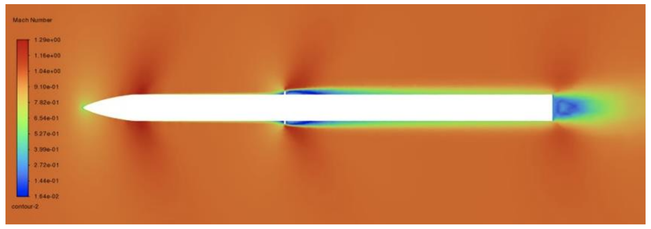
- Achieve stagnation temperature flow for 30s at Mach 3.0 seconds at Mach 3
- Measure drag and lift on a test subject
- Deploy wings and actuate control surfaces to glide vehicle back to launch location
- Use a weather balloon and a tethered launch platform to launch the vehicle at an altitude of 70,000 feet

Rocket Performance	
Maximum Speed	Mach 3
Thrust	11 000 N (avg)
Mass	60 kg (dry), 240 kg (wet)
Launch Altitude	20 km

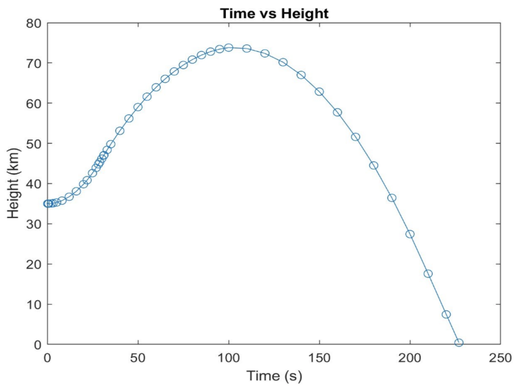
Future Tasks

- Propellant grain geometry and composition
- Nozzle throat erosion effect on engine performance
- Control of balloon ascent
- Lateral stability for autopilot
- Full scale test stand design

Recovery & Flight Planning

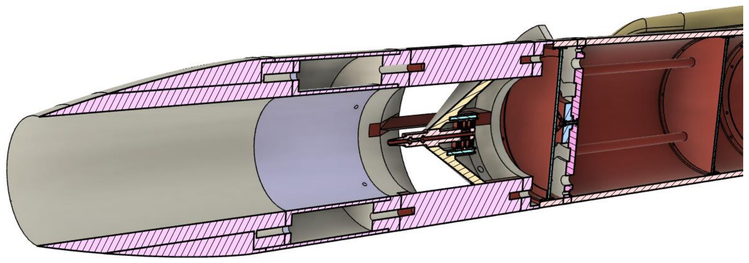


Mach contour of rocket with airbrakes deployed.

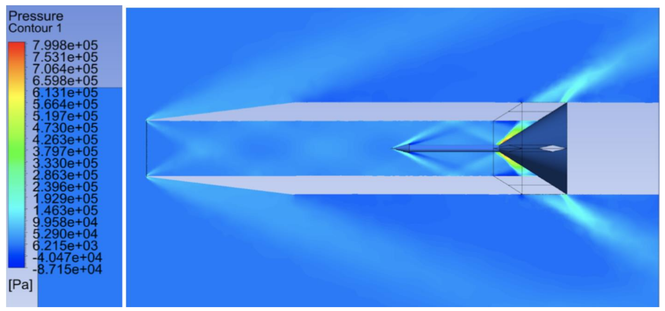


Rocket altitude prediction

Wind Tunnel Test Section

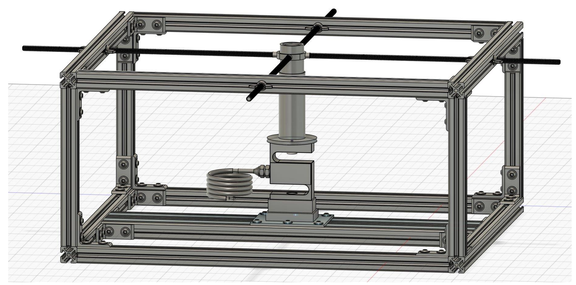


Isometric cutaway view of wind tunnel test section.

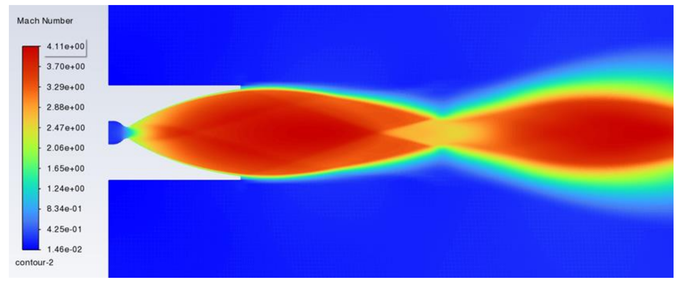


Pressure contour of wind tunnel test section

Solid Motor Design & Testing



Scaled solid motor test stand



Mach contour of rocket nozzle flow

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