FLIGHT DYNAMICS

077BAS005 BIBEK YONZAN

077BAS023 MANISH TAJPURIYA

077BAS042 SIMONKRITH LAMICHHANE

077BAS043 SIMRAN PAUDEL

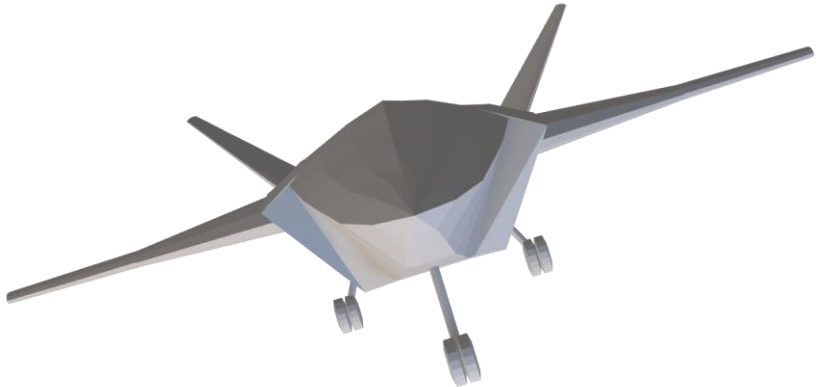
FL YING FOX

FLYING FOX

- Unmanned
- Multirole
- High speed
- High maneuverability
- Combat Aerial Vehicle

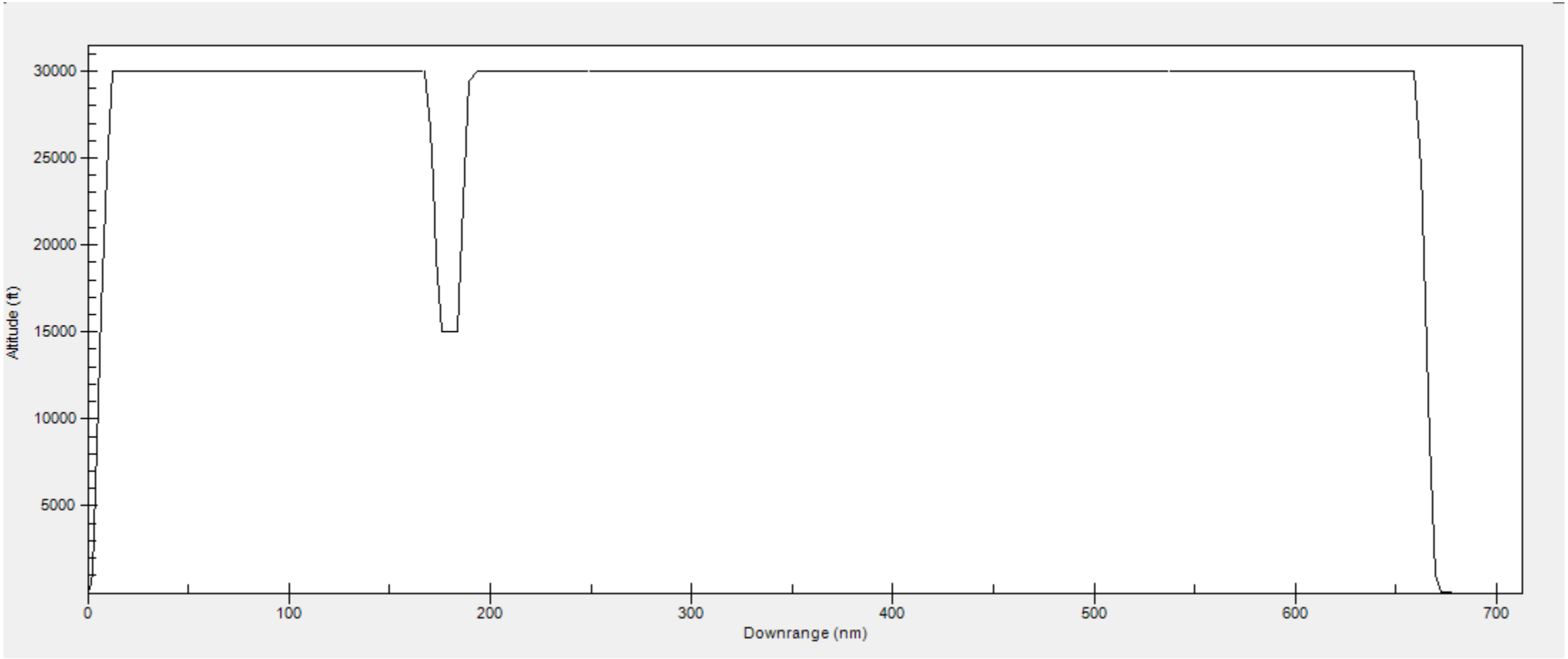
FLYING FOX

- Unmanned
- Multirole
- High speed
- High maneuverability
- Combat Aerial Vehicle

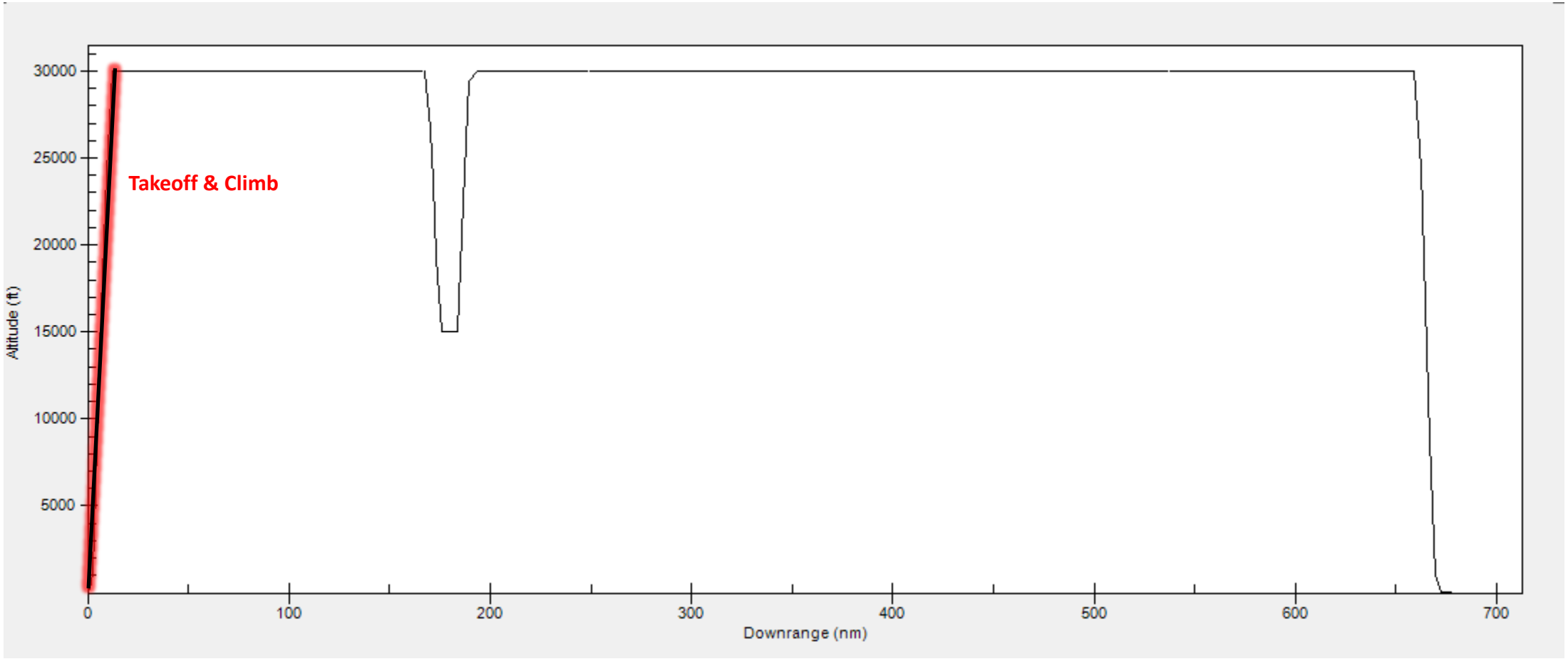


- Surveillance
- Reconnaissance
- Wingman

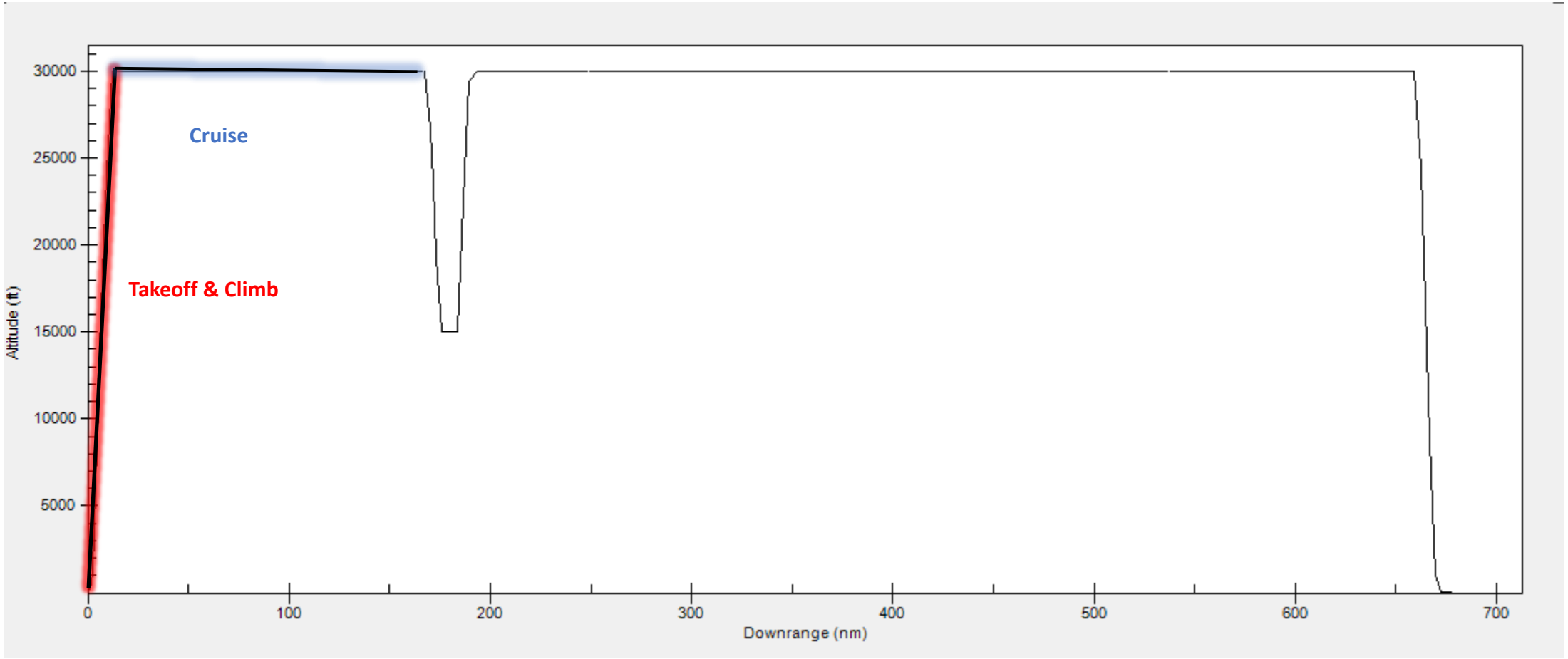
FLYING FOX MISSION PROFILE



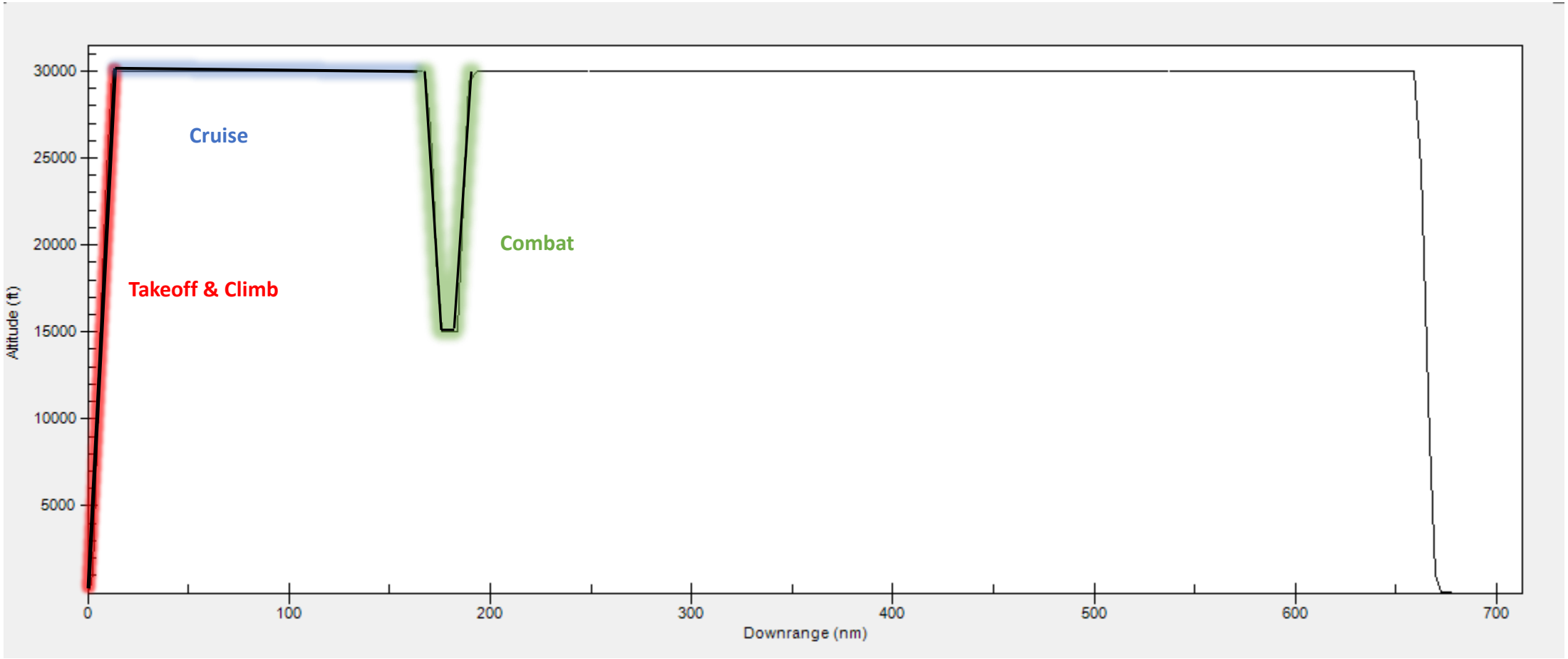
FLYING FOX MISSION PROFILE



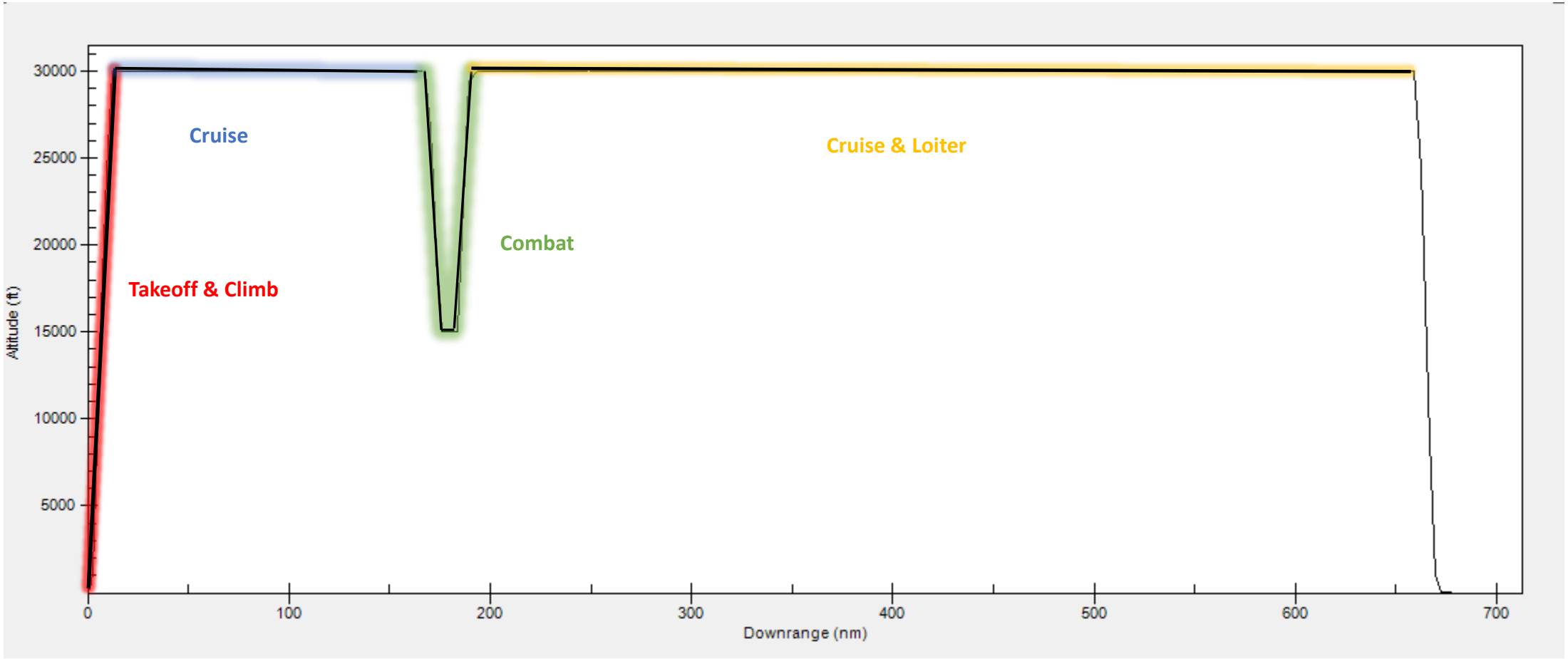
FLYING FOX MISSION PROFILE



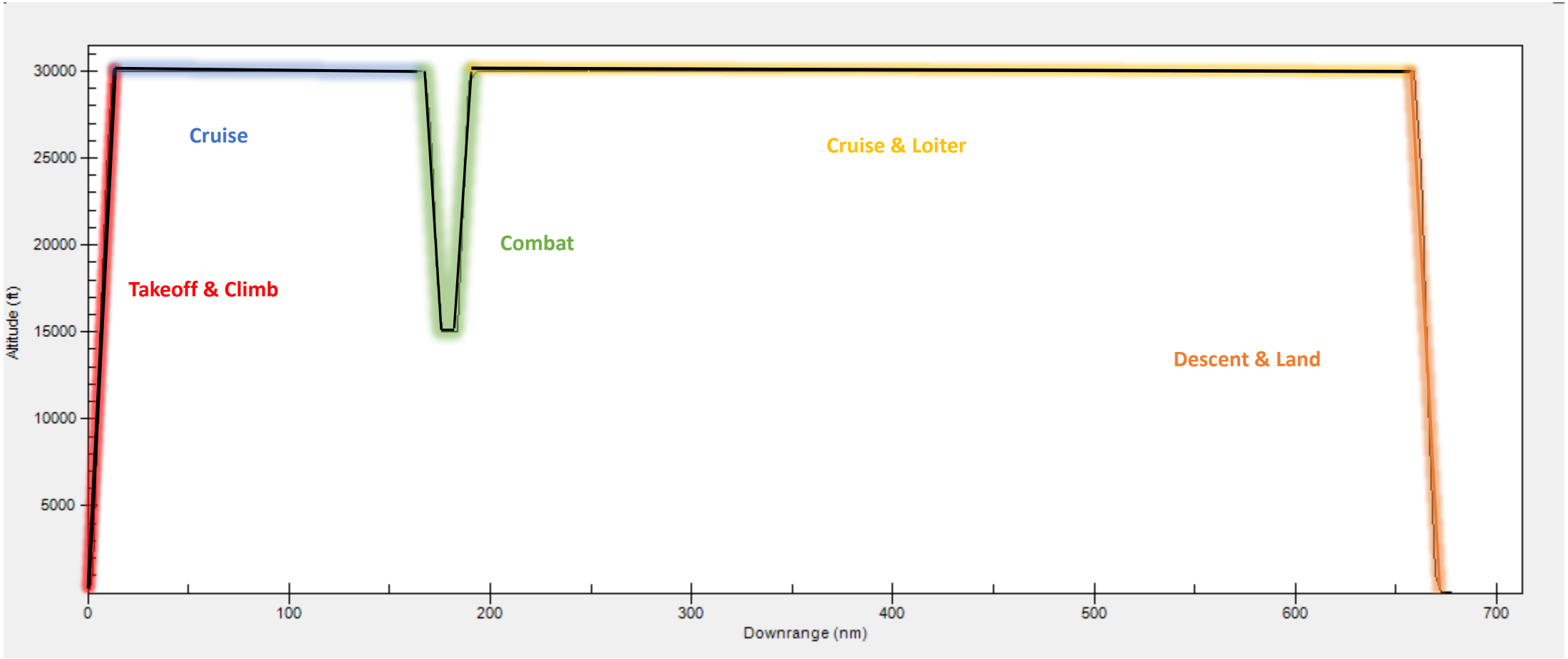
FLYING FOX MISSION PROFILE



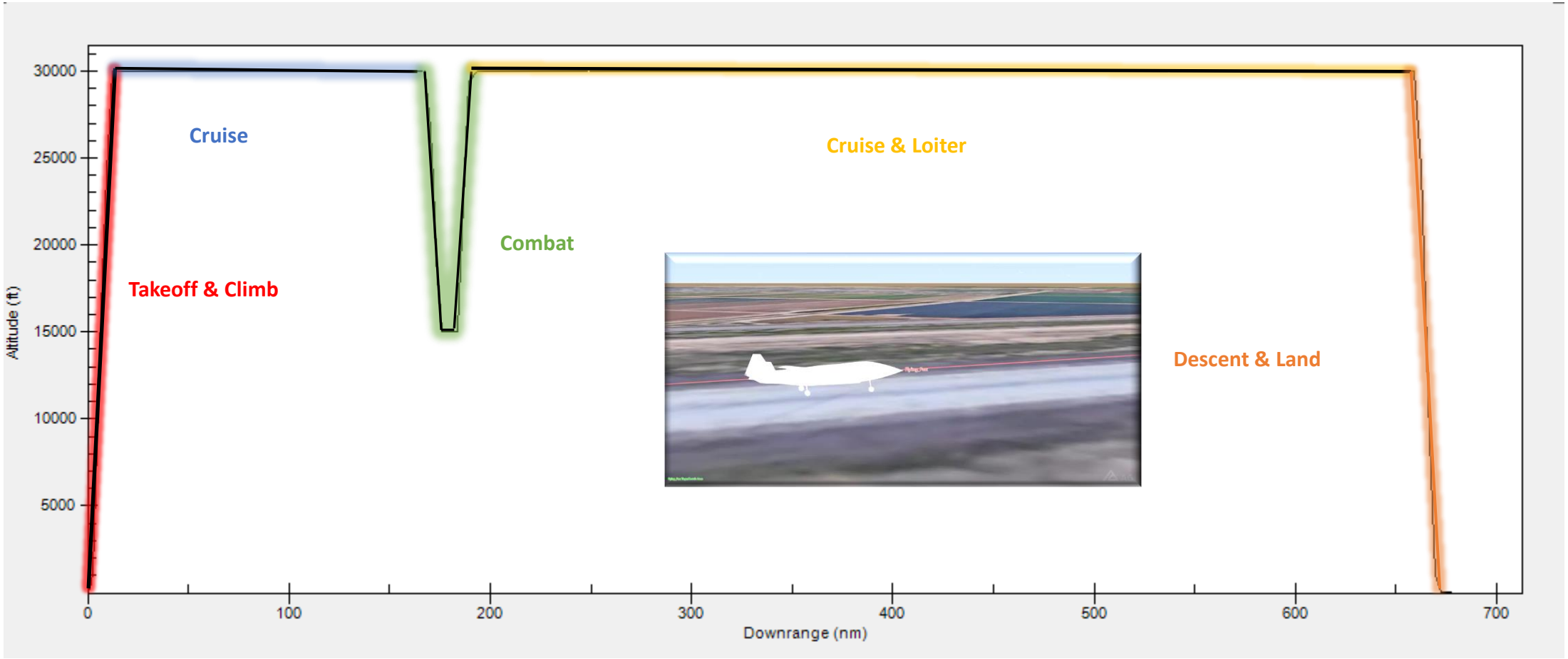
FLYING FOX MISSION PROFILE



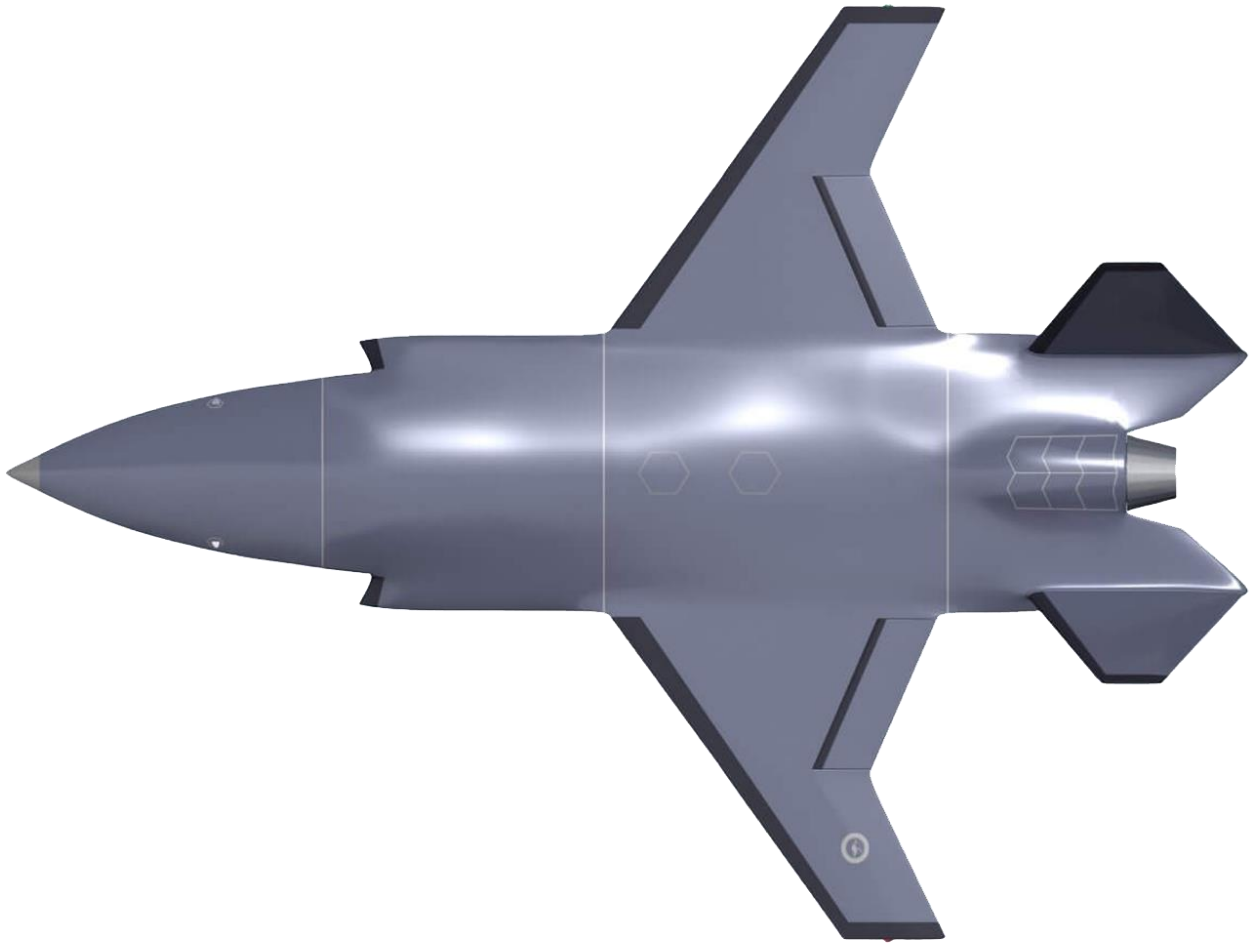
FLYING FOX MISSION PROFILE



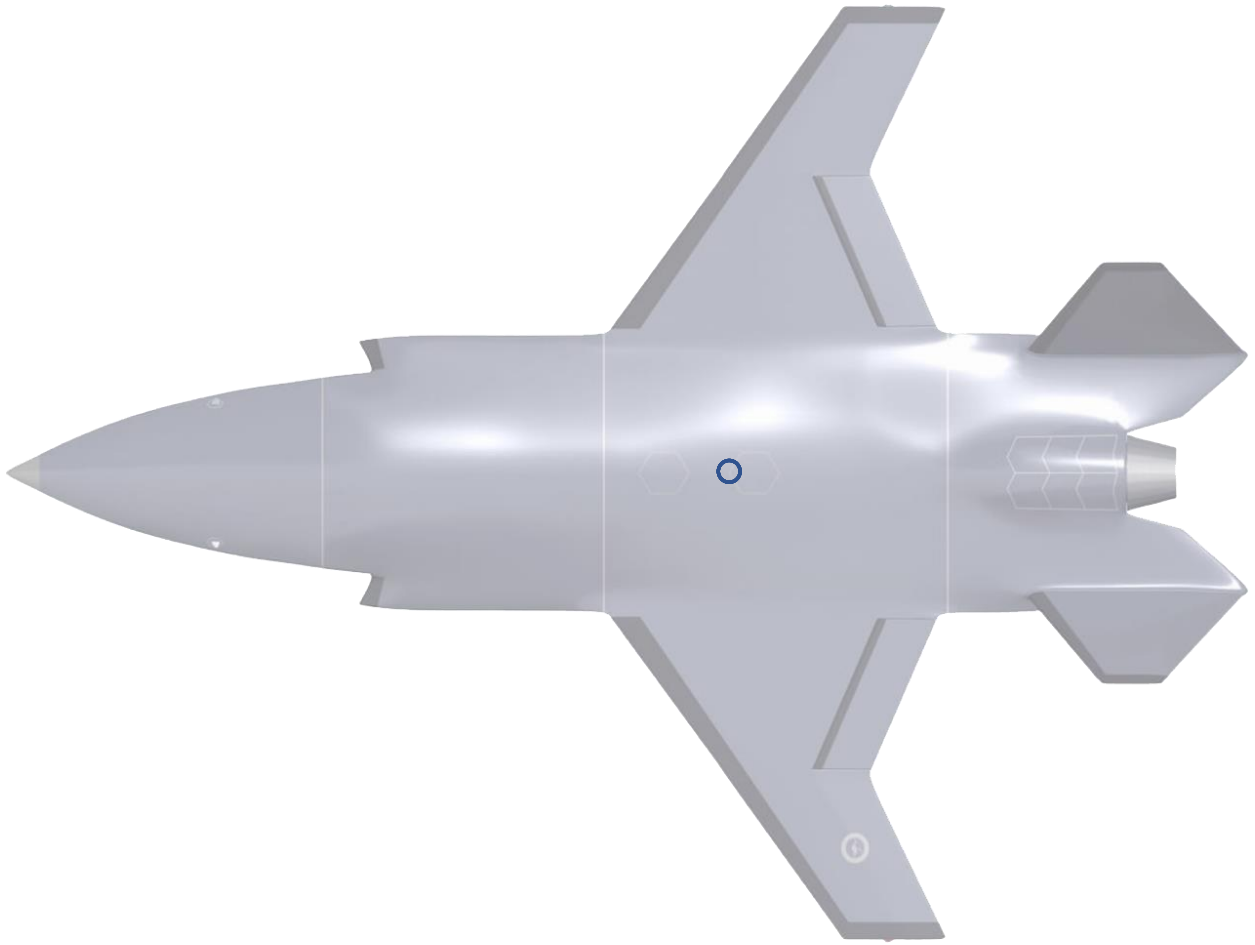
FLYING FOX MISSION PROFILE



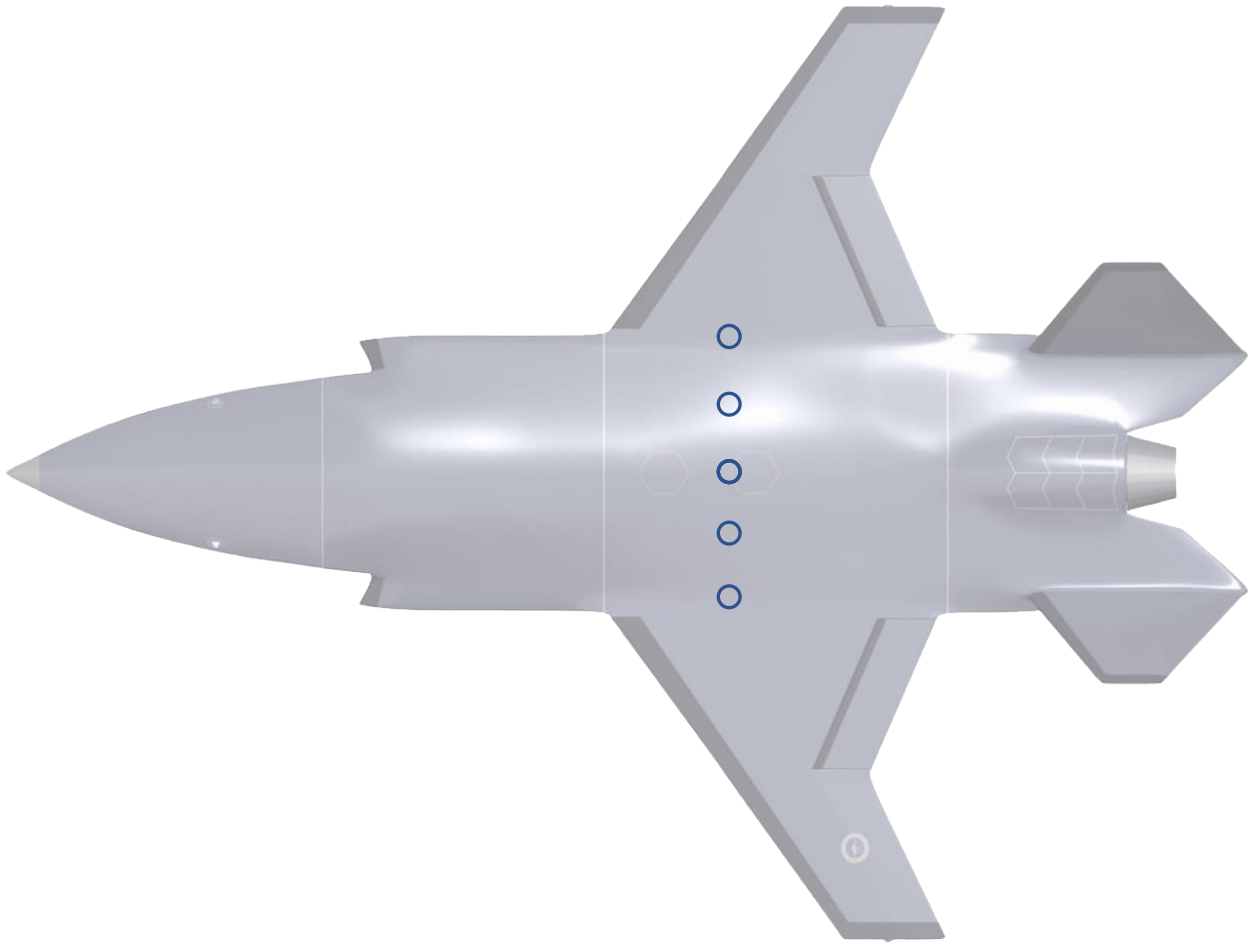
PLANEMAKER



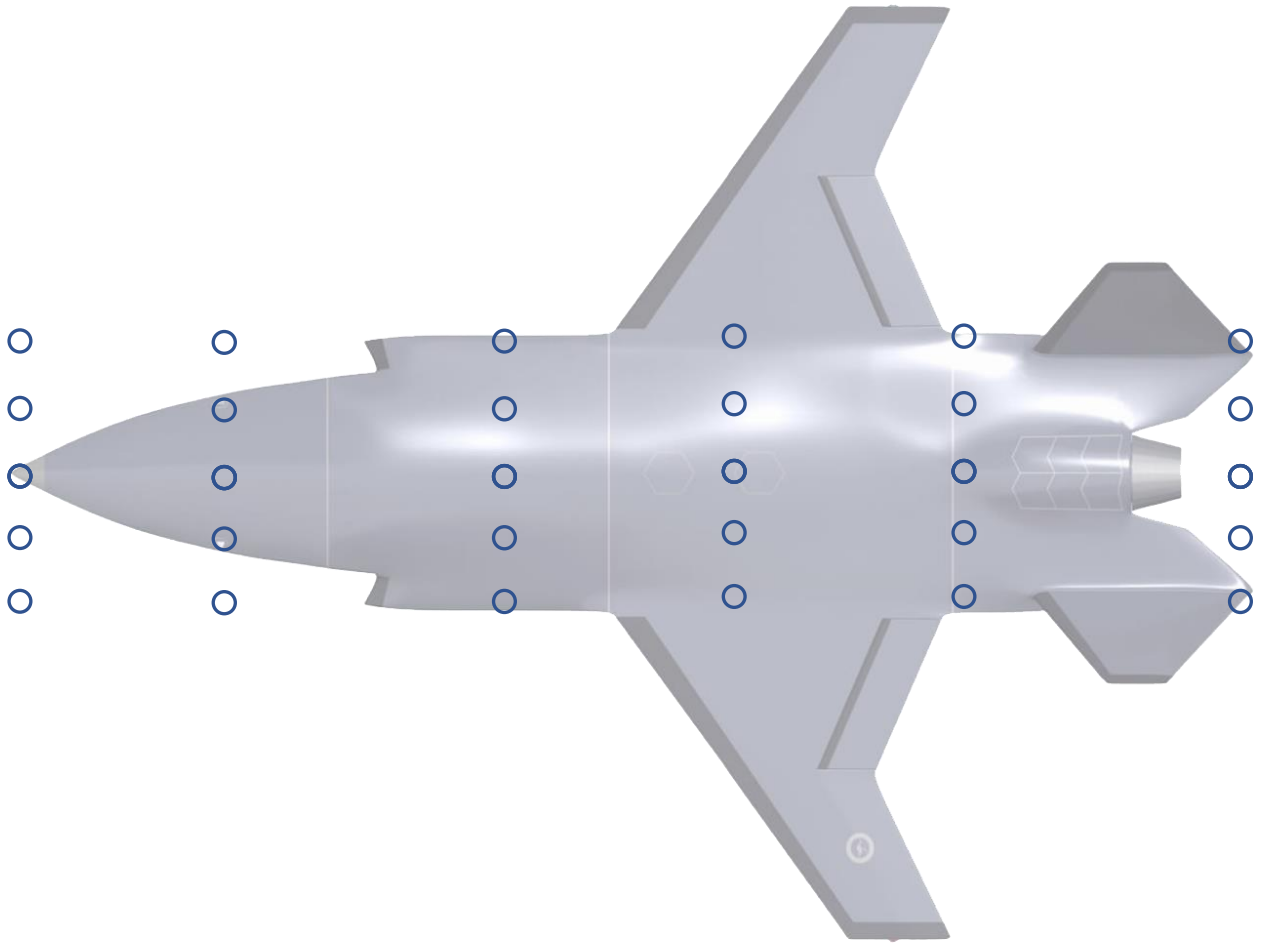
PLANEMAKER



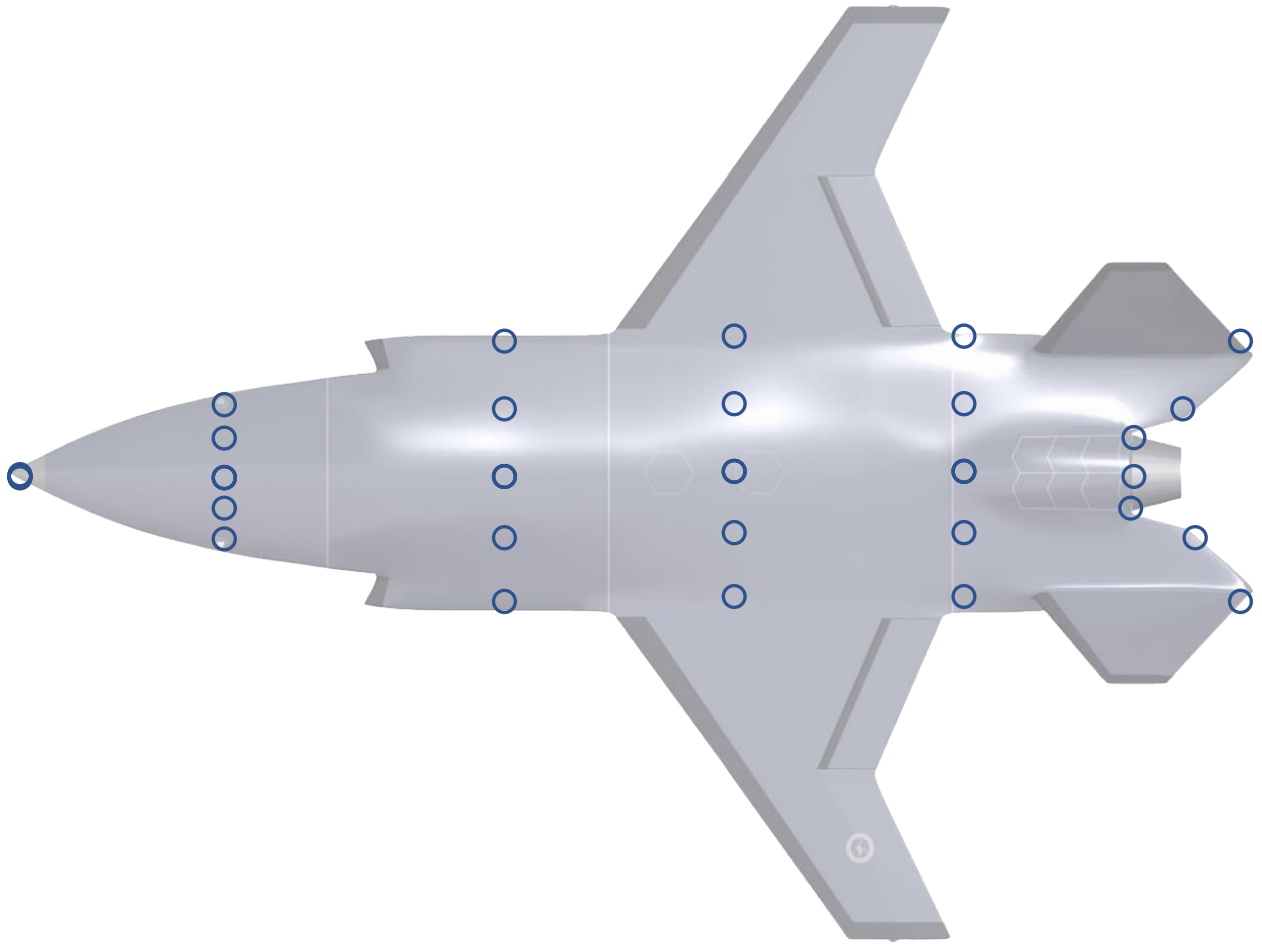
PLANEMAKER



PLANEMAKER

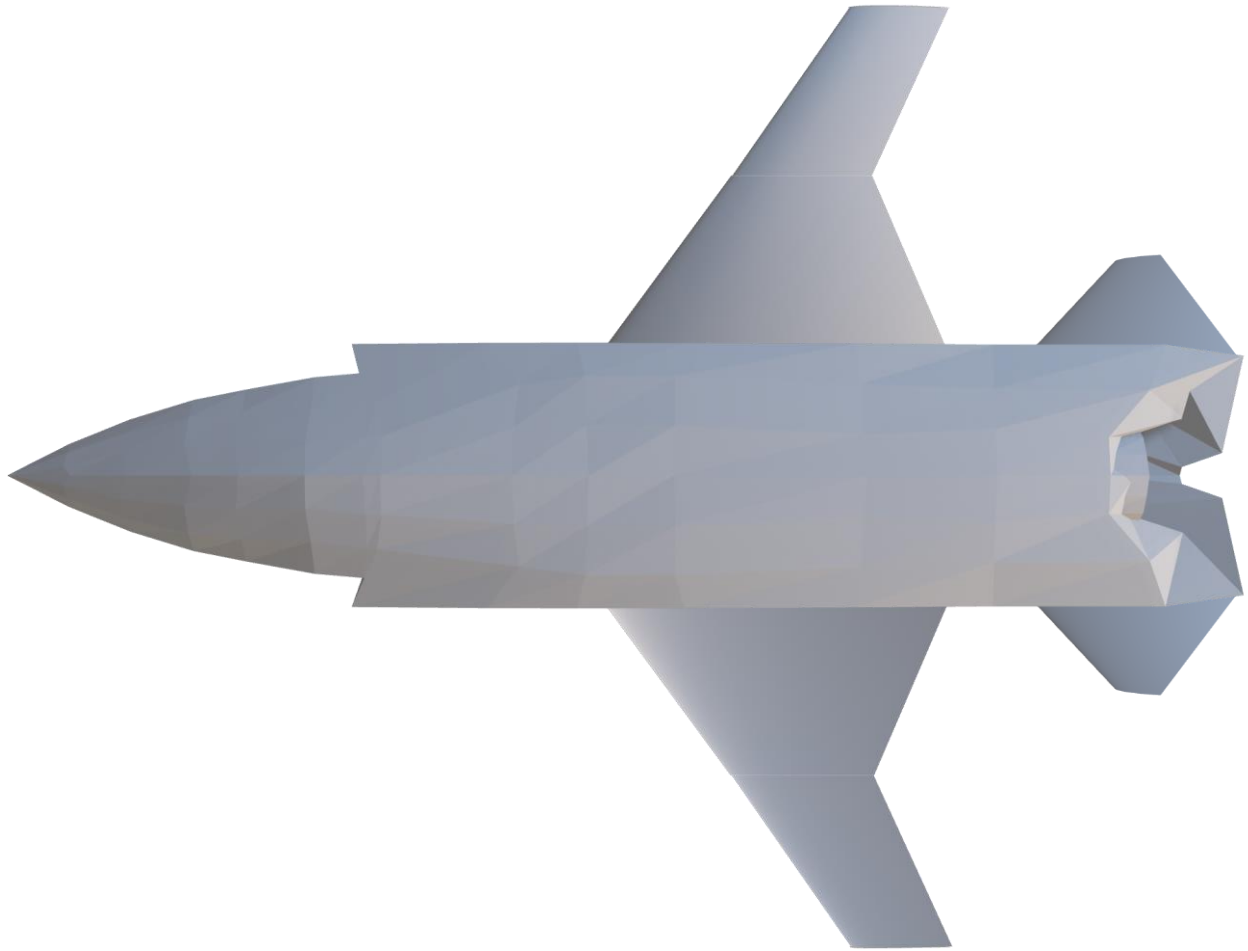


PLANEMAKER

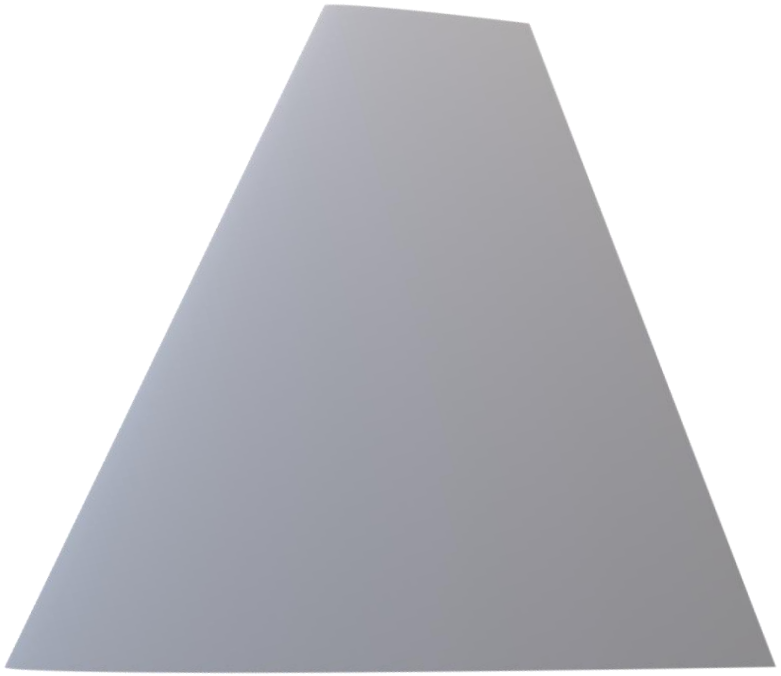


PLANEMAKER

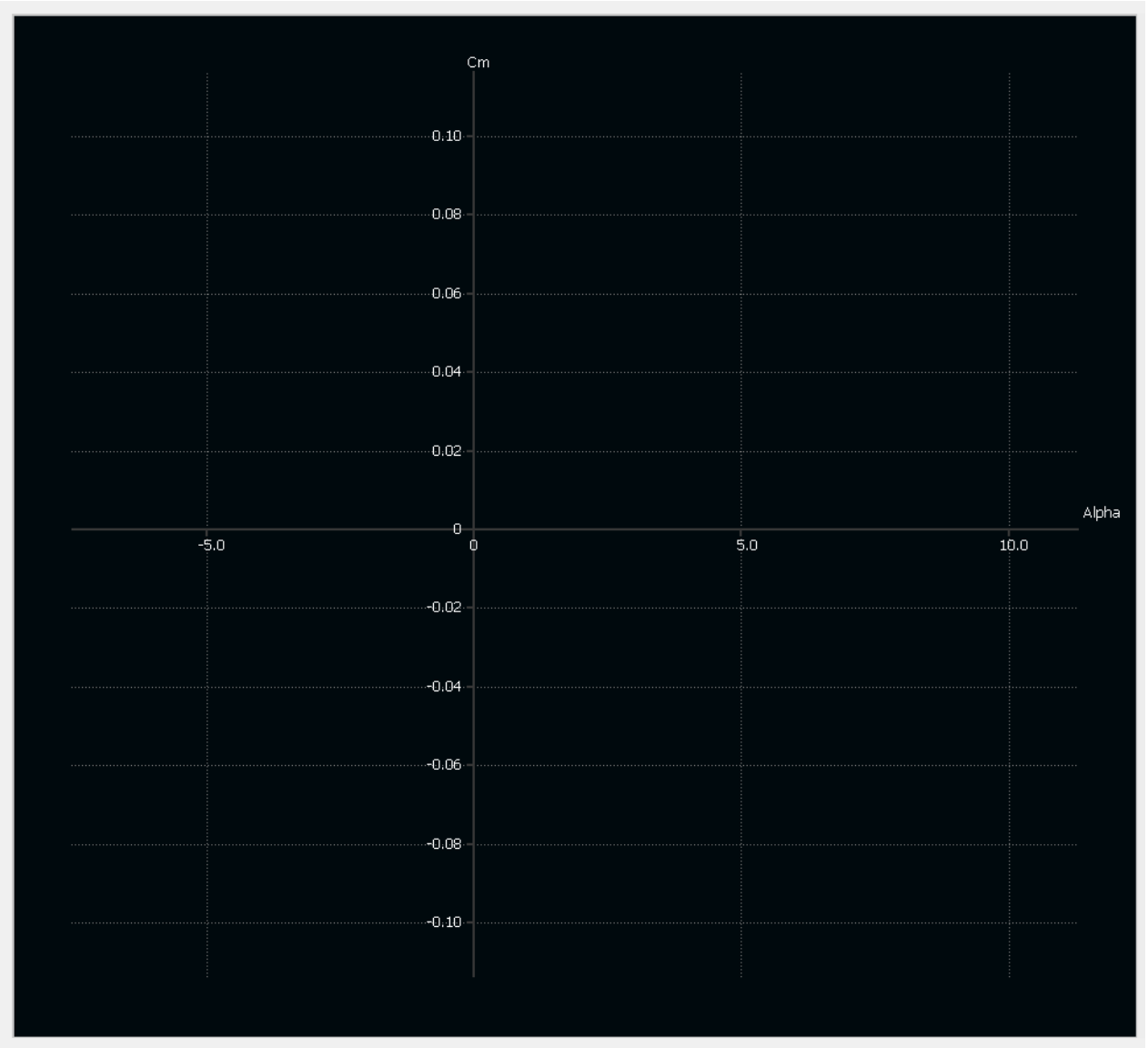
PLANEMAKER



XFLR5 ANALYSIS

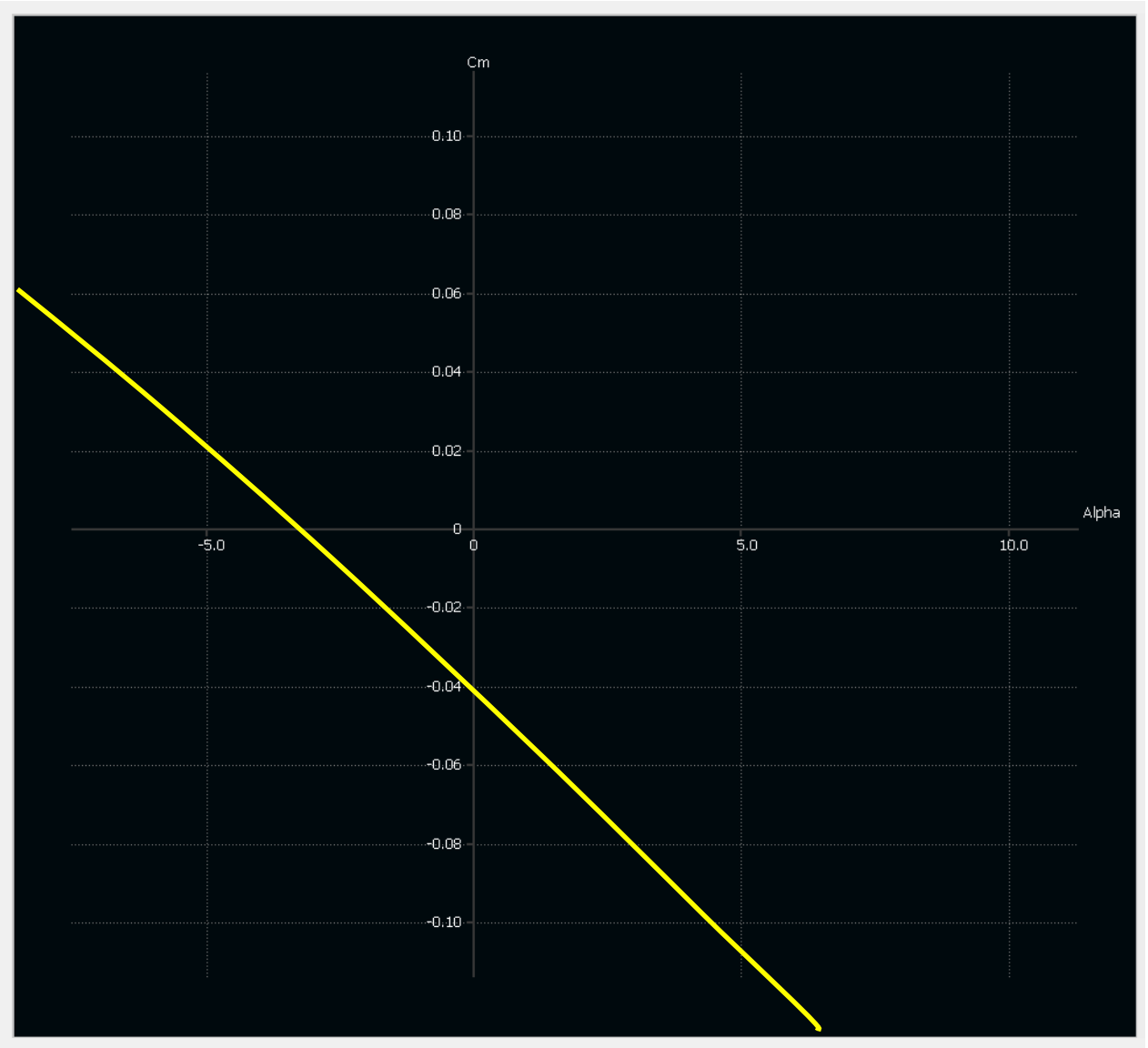


Tail Configuration



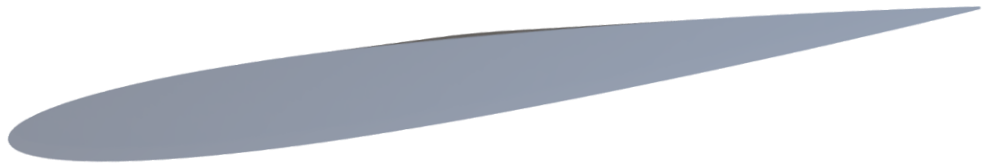
Graph Cm vs α

XFLR5 ANALYSIS

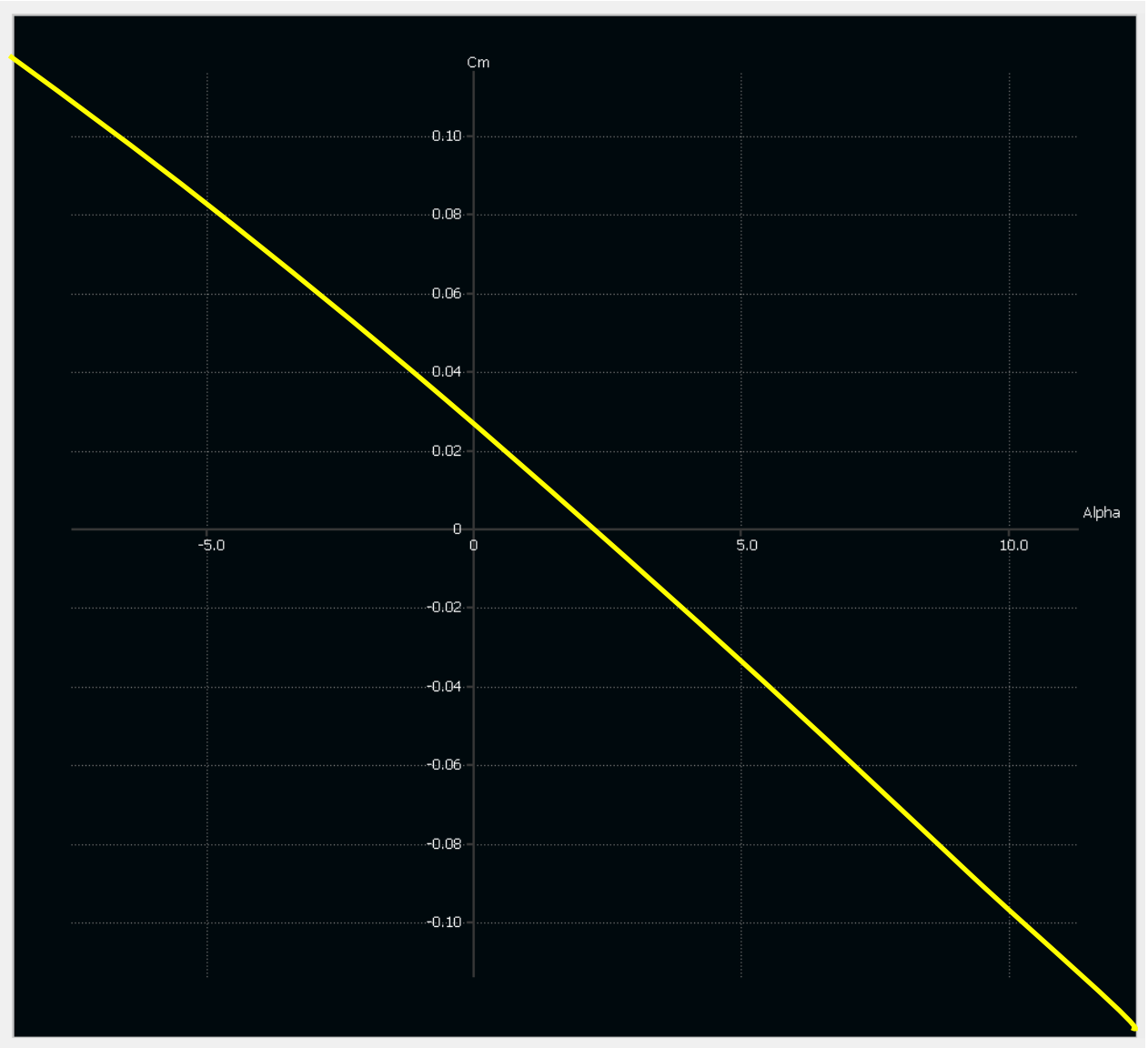


Graph Cm vs α [Unstable]

XFLR5 ANALYSIS



-ve 8 ^{0}angle of incidence



Graph Cm vs α [stable]

XFLR5 ANALYSIS

Airfoil Selection

- High stability
- Low drag
- Symmetric

0009

XFLR5 ANALYSIS

Airfoil Selection

- High stability
- Low drag
- Symmetric

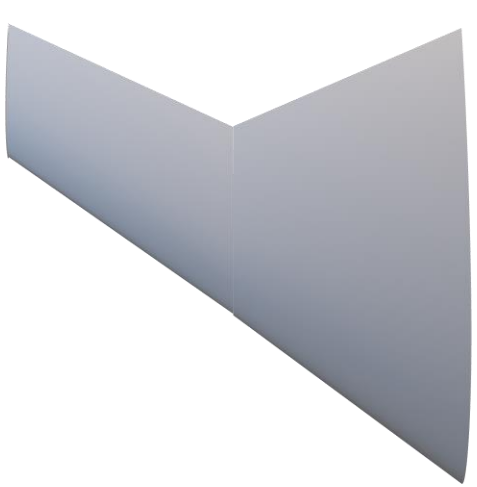
0009

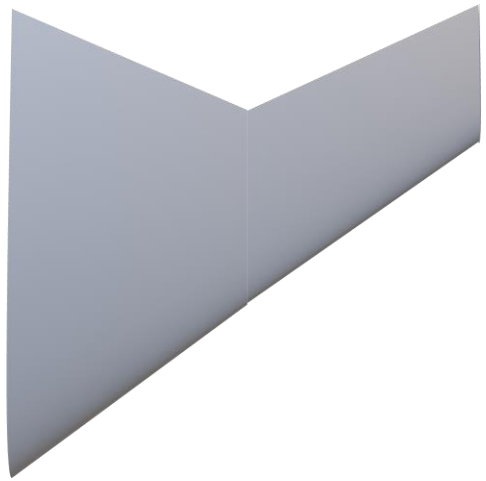
- Good stability
- Enhanced lift
- Delay drag rise

2412

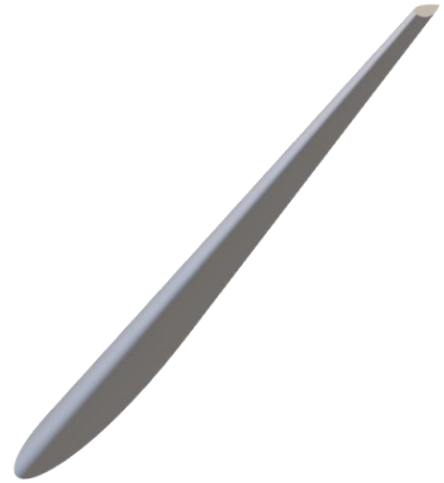
XFLR5 ANALYSIS

Configuration





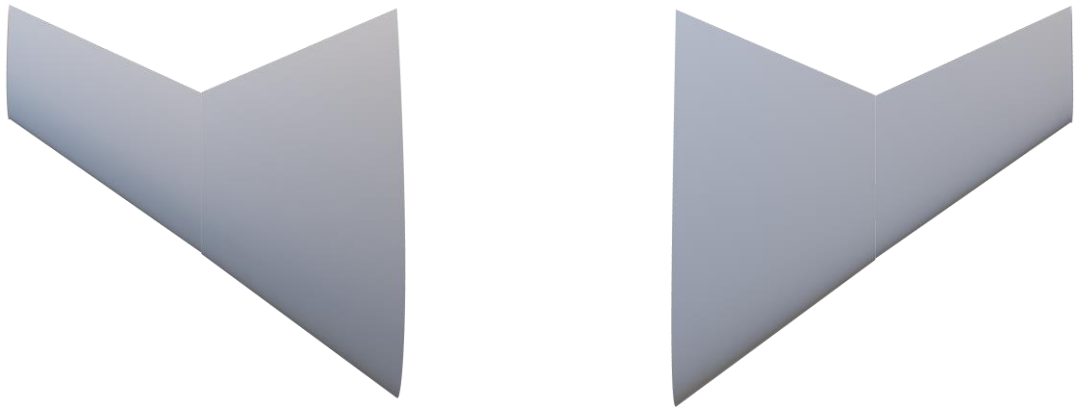
Swept Wing



V tail

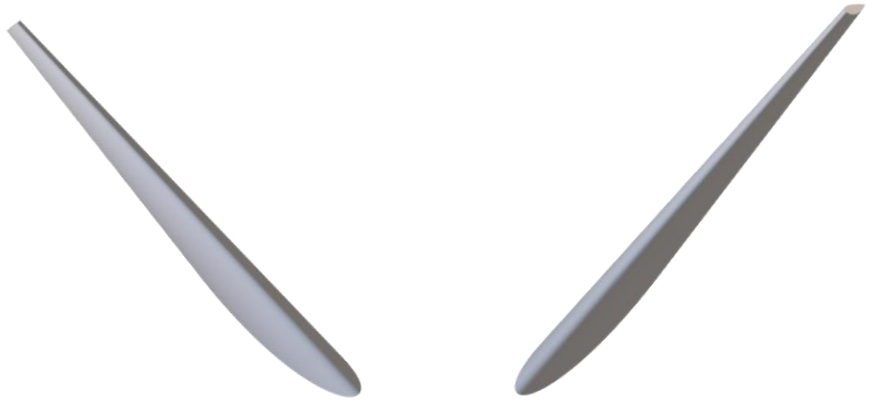
XFLR5 ANALYSIS

Configuration



Swept Wing

- Reduces adverse effects of transonic & supersonic flow
- Increase Divergence Mach number
- High maneuverability with low aspect ratio



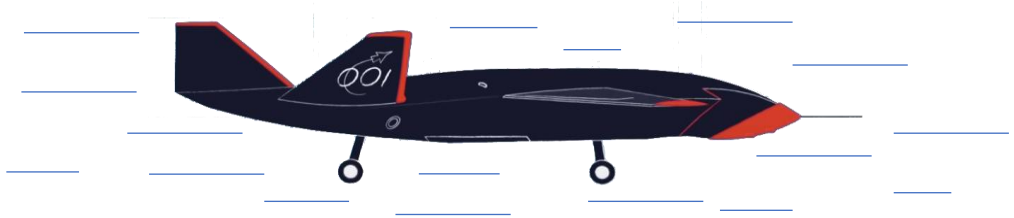
V tail

- Reduced Interference Drag
- Reduced weight than conventional tail configuration
- Enhanced Maneuverability

STABILITY TEST

High Altitude High Speed [Mode H]

Altitude – 44,000 ft (above MSL)
Speed – 171 knots (IAS)



Low Altitude Low Speed [Mode L]

Altitude – 16,000 ft (above MSL)
Speed – 155 knots (IAS)

*Images not to scale

STABILITY TEST

High Altitude High Speed [Mode H]

Altitude – 44,000 ft (above MSL)
Speed – 171 knots (IAS)

Low Altitude Low Speed [Mode L]

Altitude – 16,000 ft (above MSL)
Speed – 155 knots (IAS)

STABILITY TEST

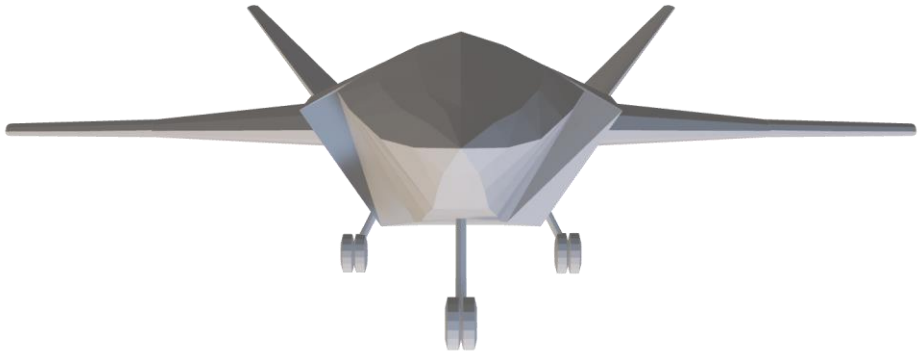
Spiral Mode

High Altitude High Speed [Mode H]

Low Altitude Low Speed [Mode L]

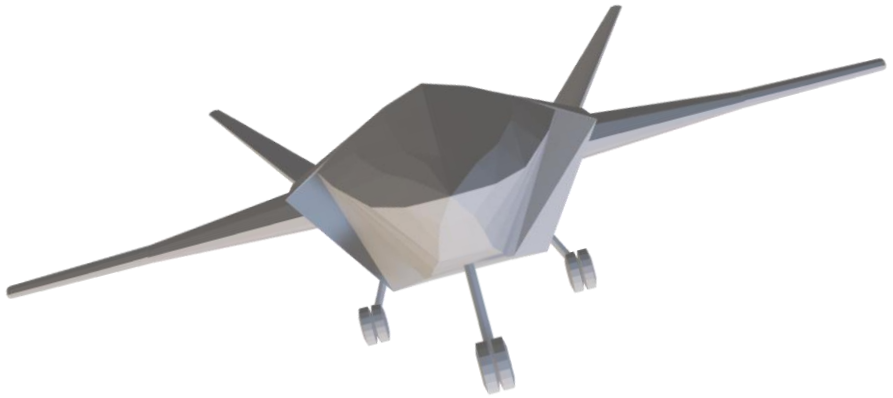
STABILITY TEST

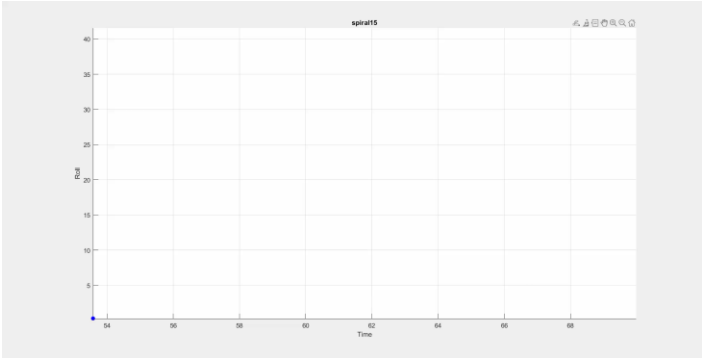
Spiral Mode



STABILITY TEST

Spiral Mode

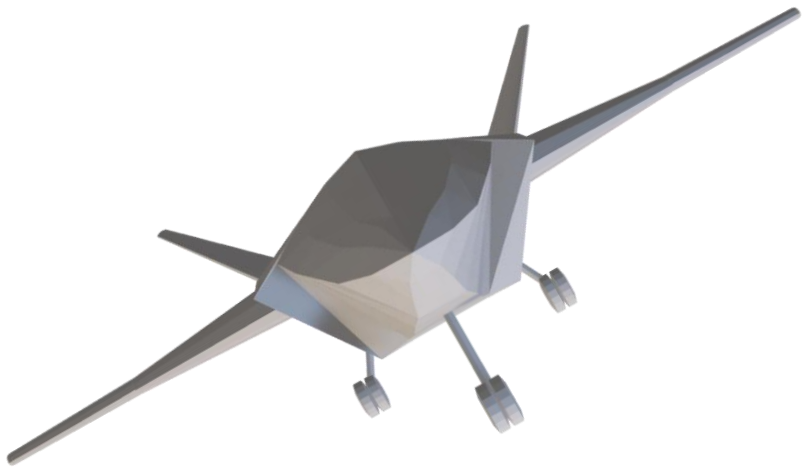


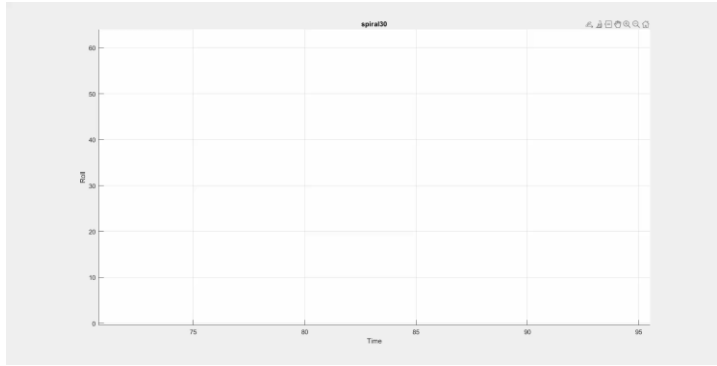


15^0

STABILITY TEST

Spiral Mode

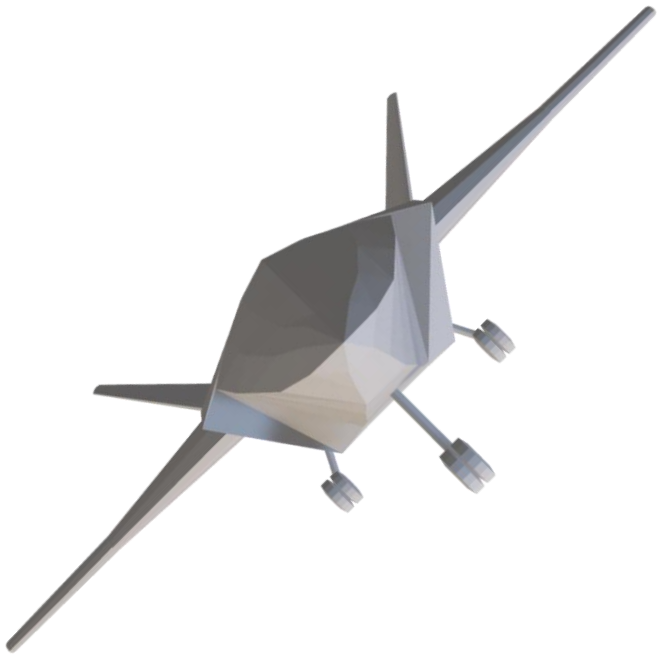


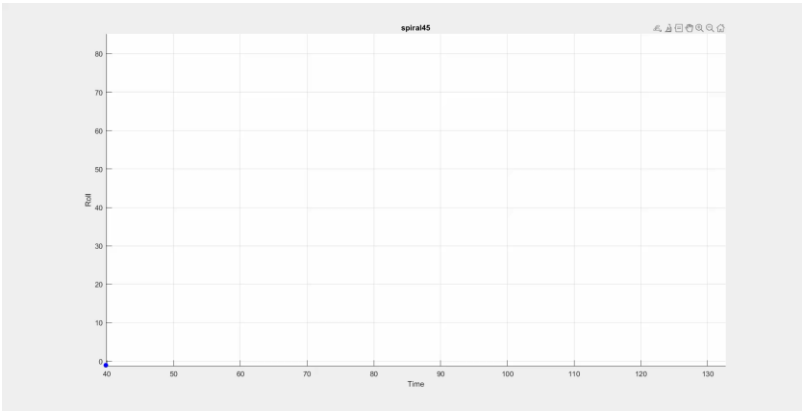


30^0

STABILITY TEST

Spiral Mode





45^0

STABILITY TEST

Spiral Mode

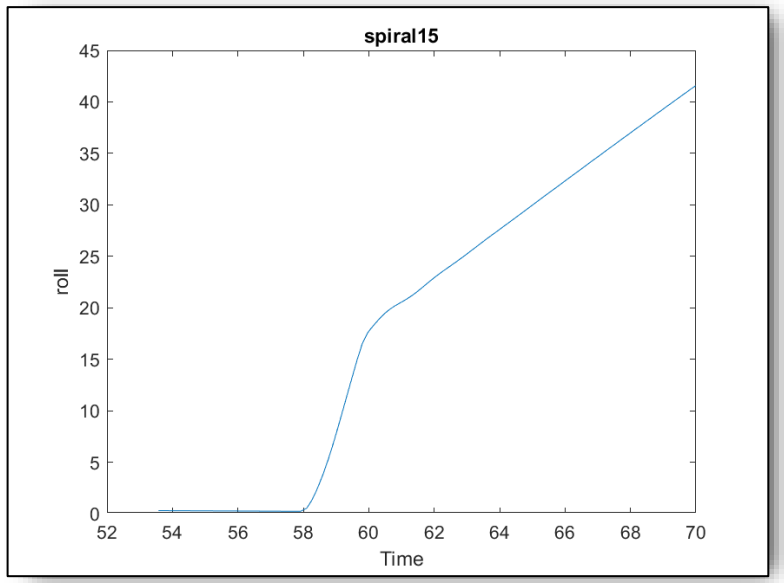
High Altitude High Speed [Mode H]

Low Altitude Low Speed [Mode L]

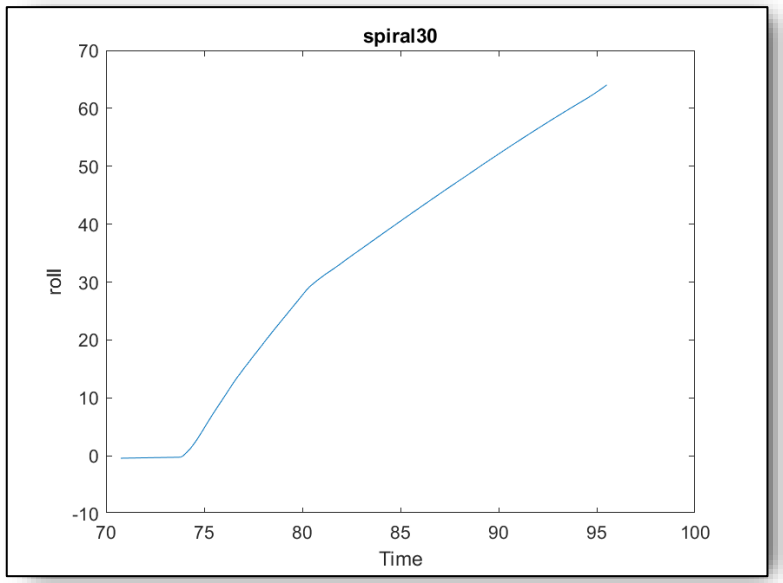
STABILITY TEST

Spiral Mode

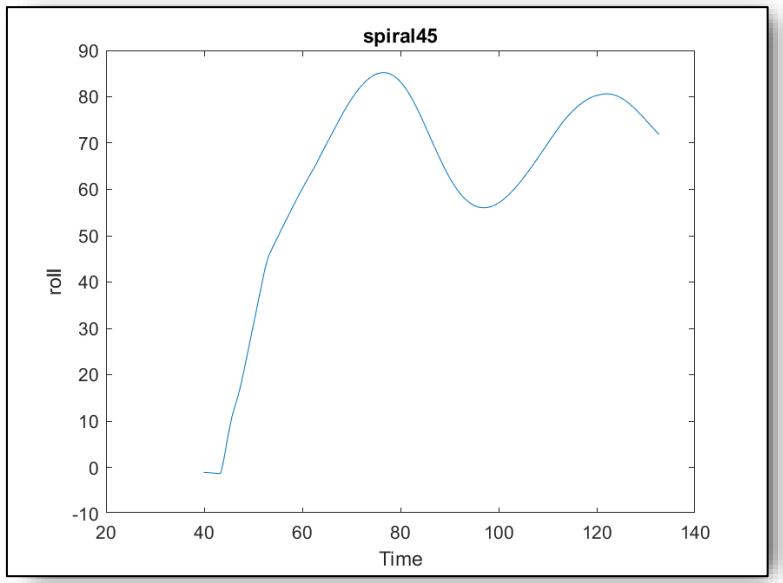
[Mode H]



15^0



30^0



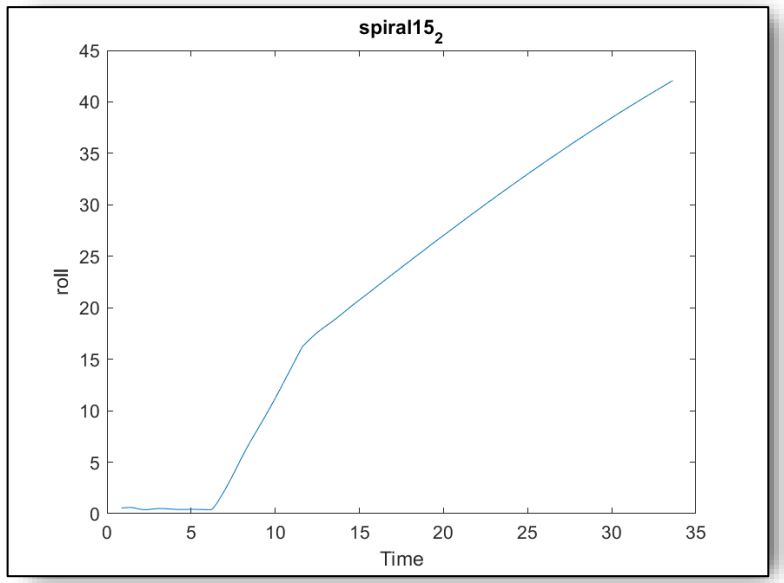
45^0

Graph Roll vs Time

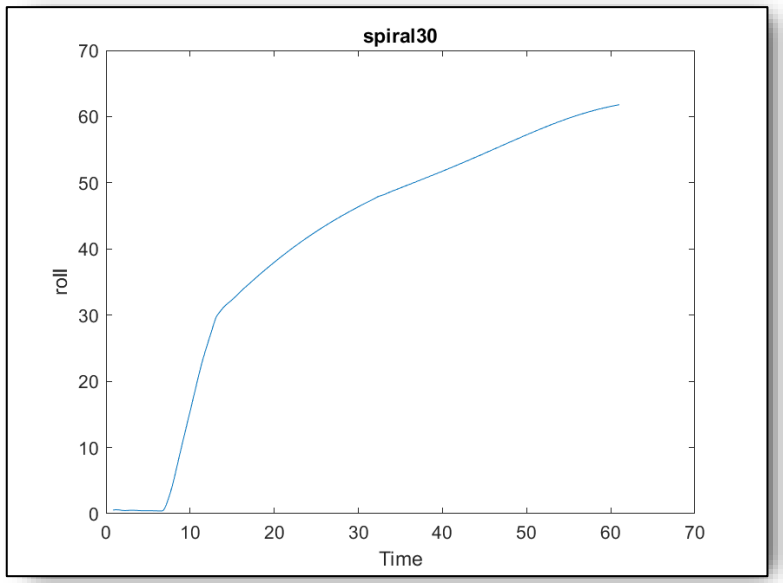
STABILITY TEST

Spiral Mode

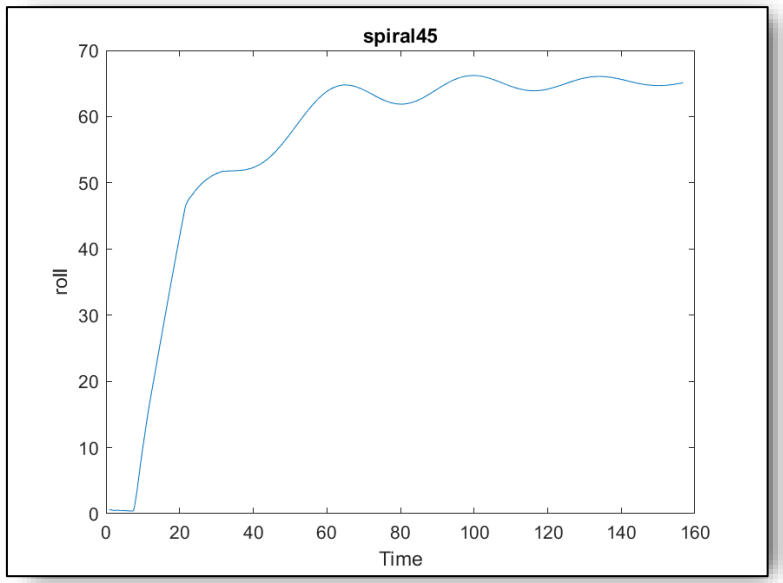
[Mode L]



15^0



30^0

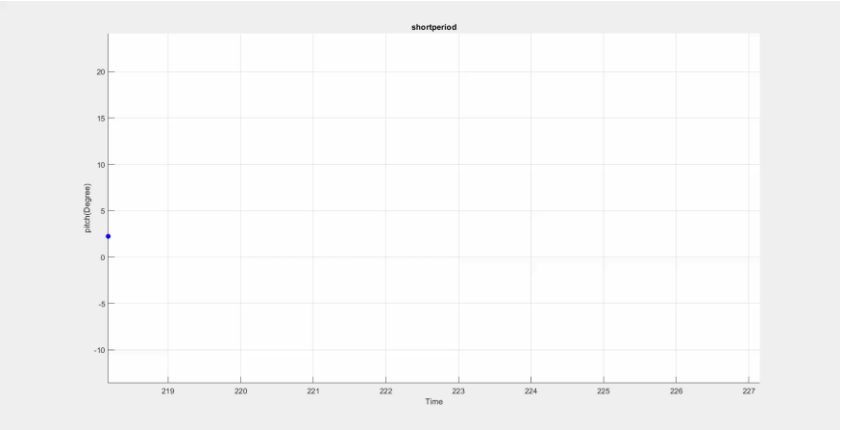


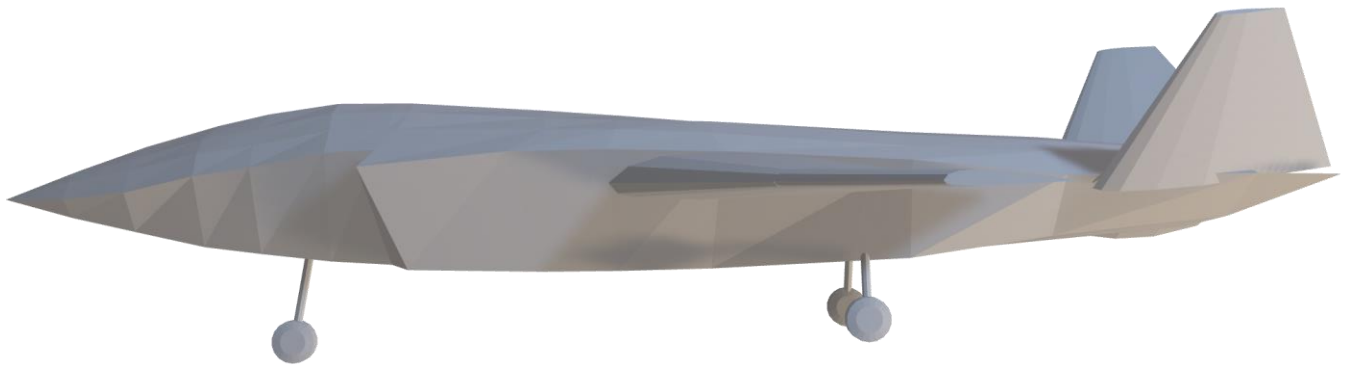
45^0

Graph Roll vs Time

STABILITY TEST

Short Period Mode





Pitch Doublet

STABILITY TEST

Short Period Mode

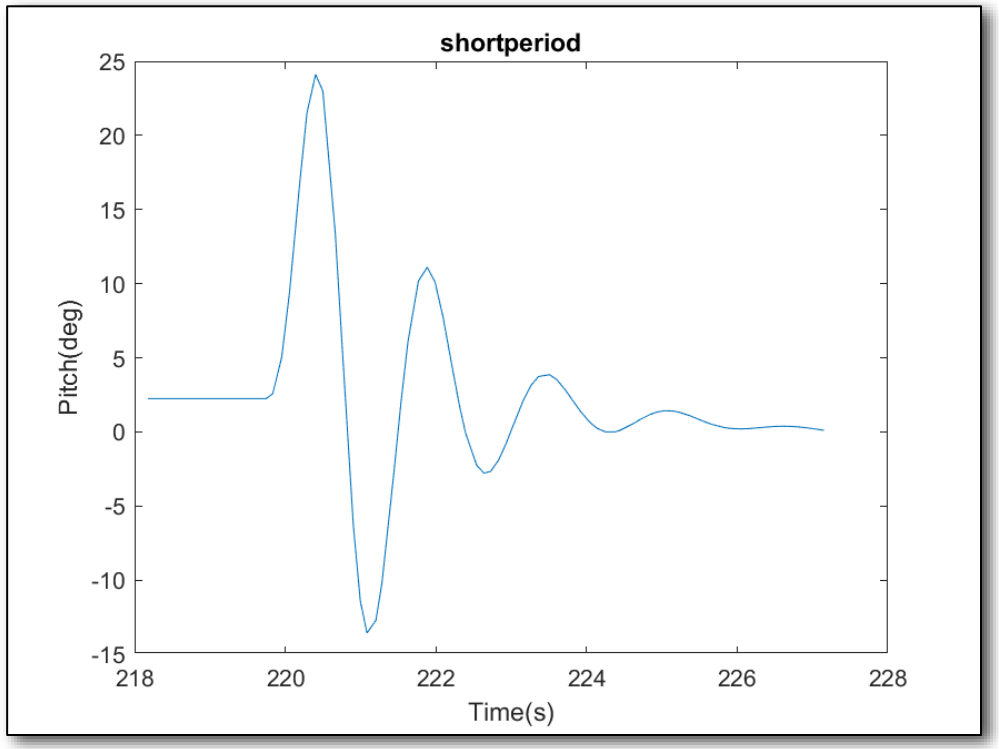
High Altitude High Speed [Mode H]

Low Altitude Low Speed [Mode L]

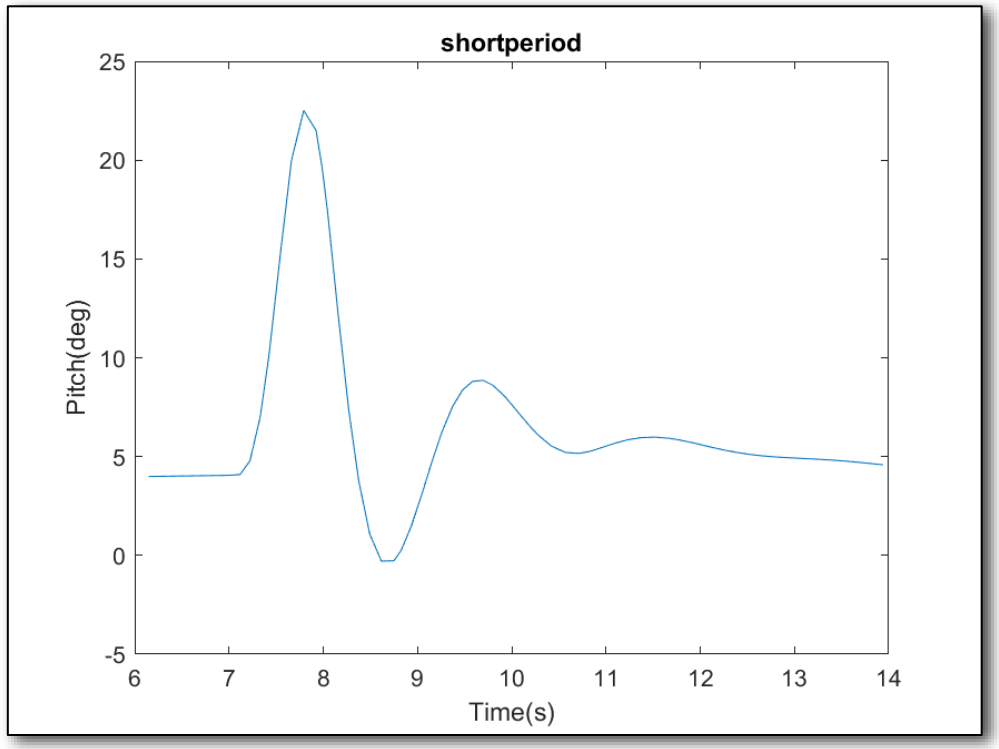
STABILITY TEST

Short Period Mode

[Mode H]



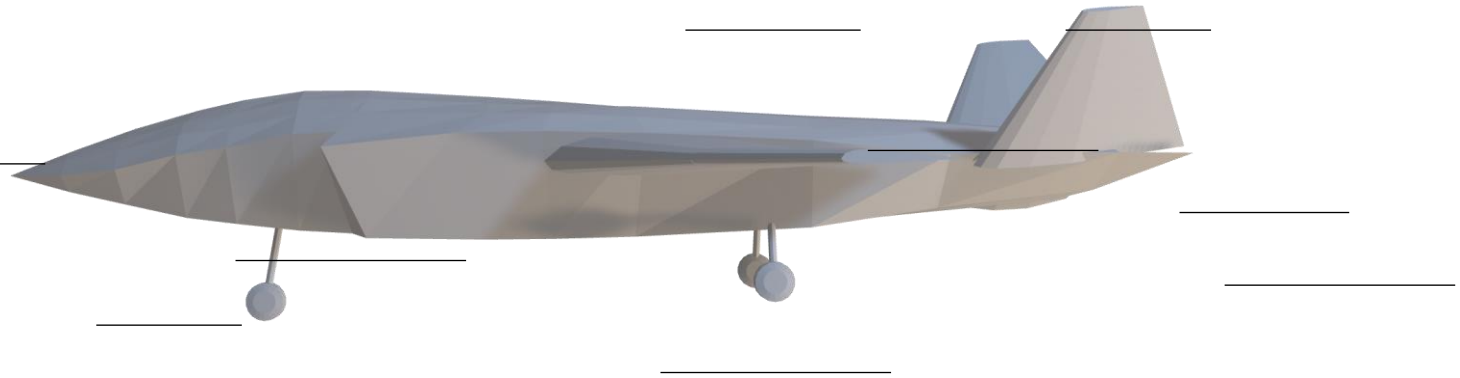
[Mode L]



Graph Pitch vs Time

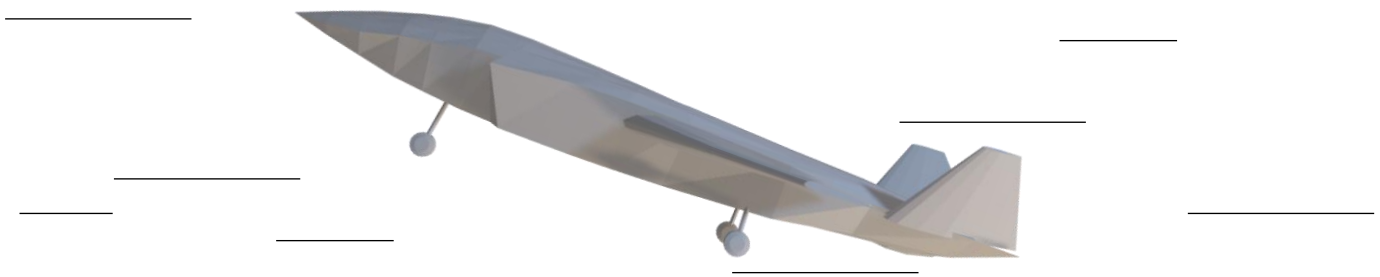
STABILITY TEST

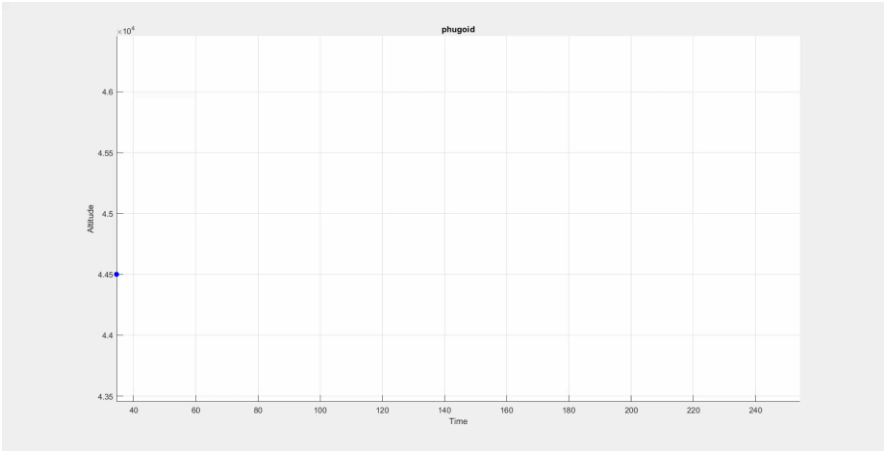
Phugoid Mode



STABILITY TEST

Phugoid Mode





20^0 Nose Up , 10% decrease in velocity

STABILITY TEST

Phugoid Mode

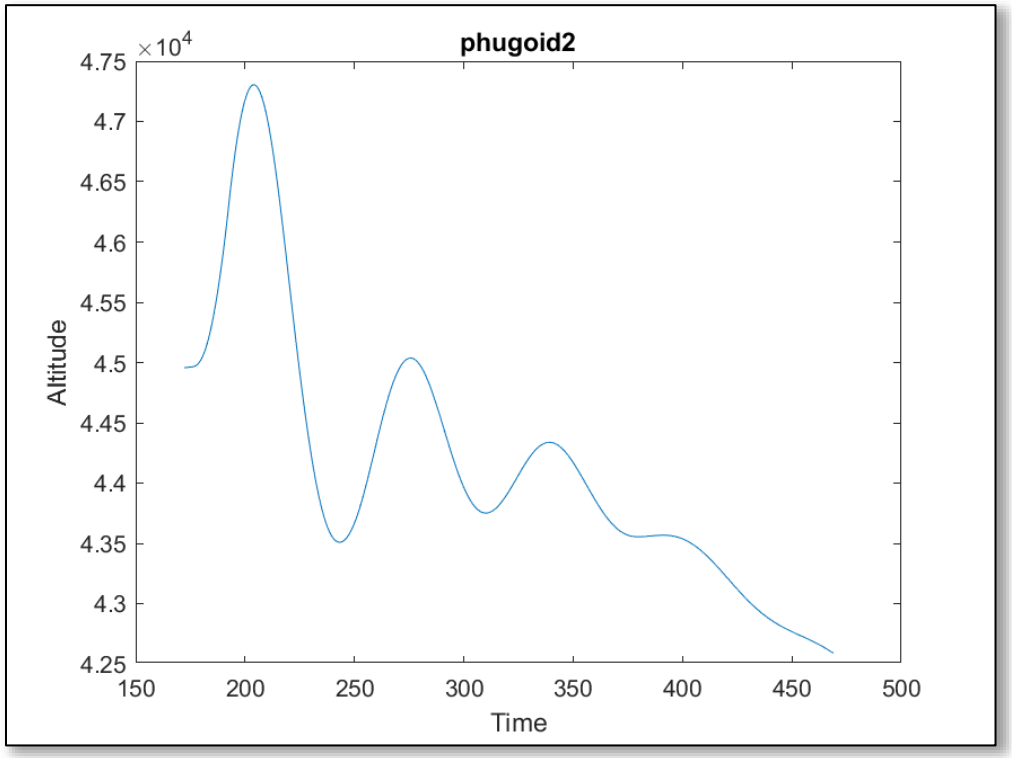
High Altitude High Speed [Mode H]

Low Altitude Low Speed [Mode L]

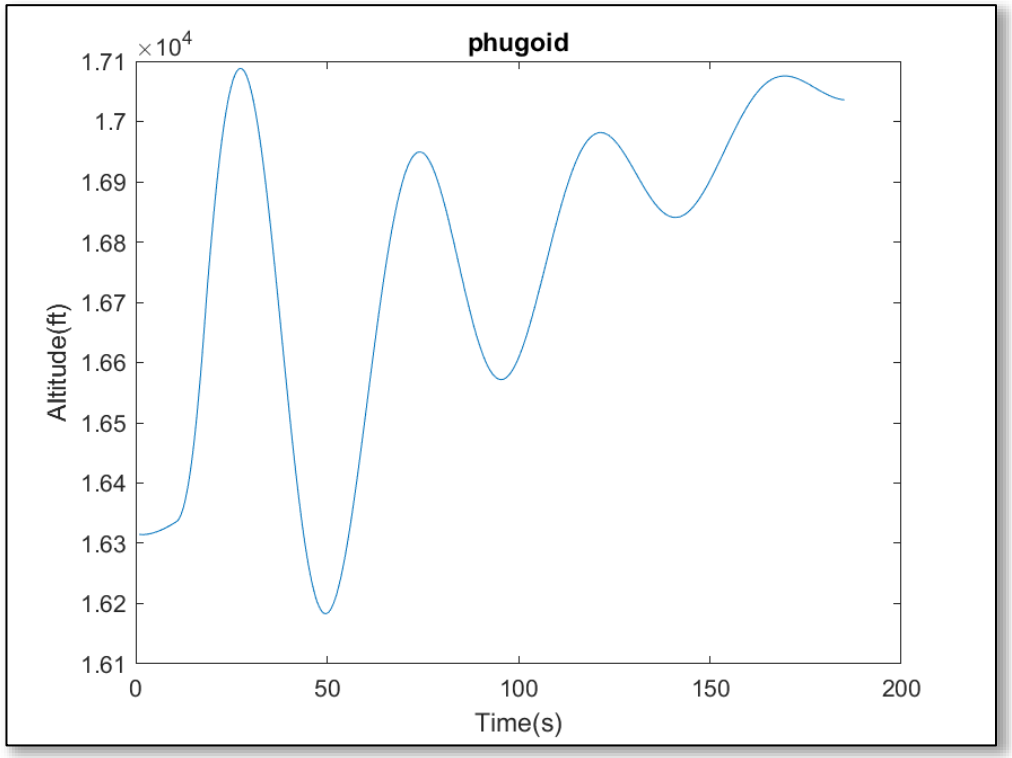
STABILITY TEST

Phugoid Mode

[Mode H]



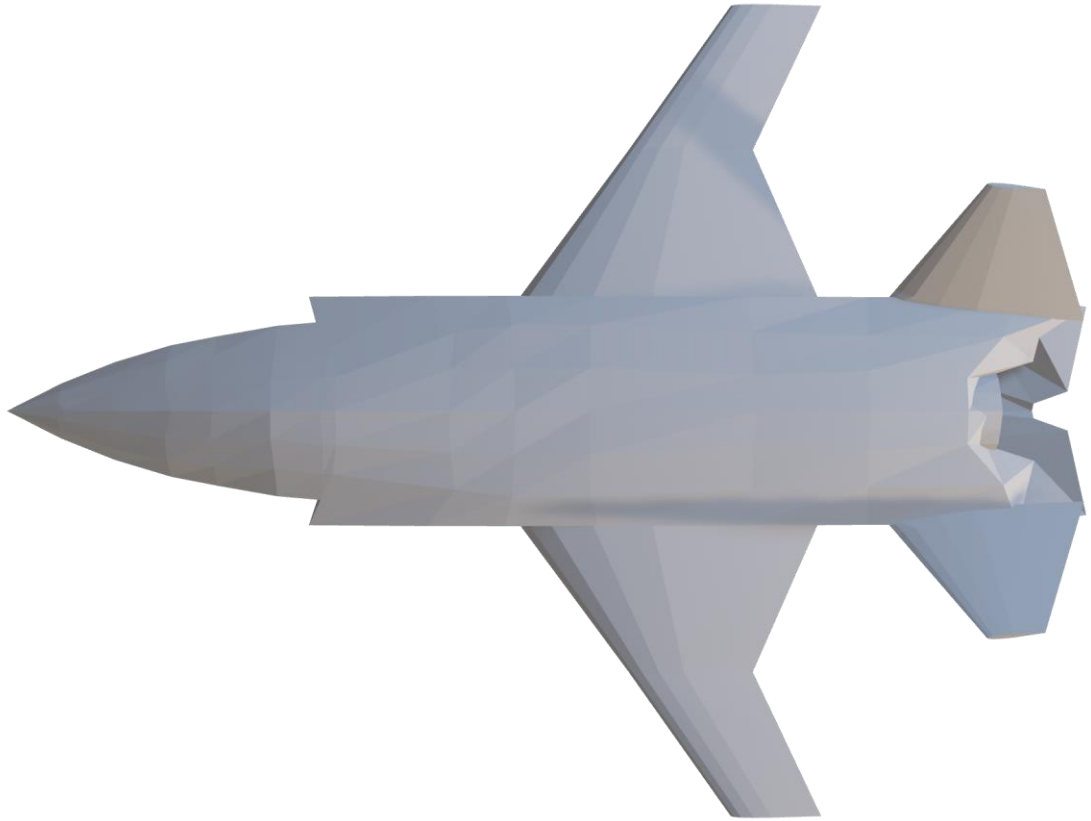
[Mode L]

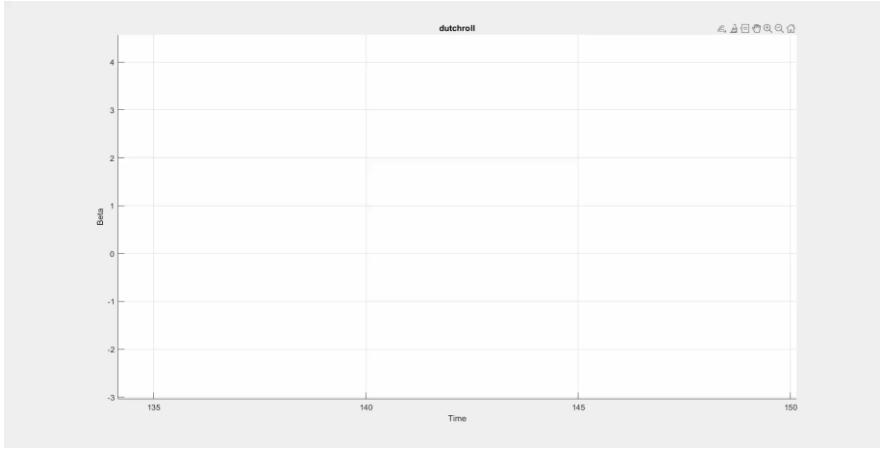


Graph Altitude vs Time

STABILITY TEST

Dutch Roll





Rudder Doublet

STABILITY TEST

Dutch Roll

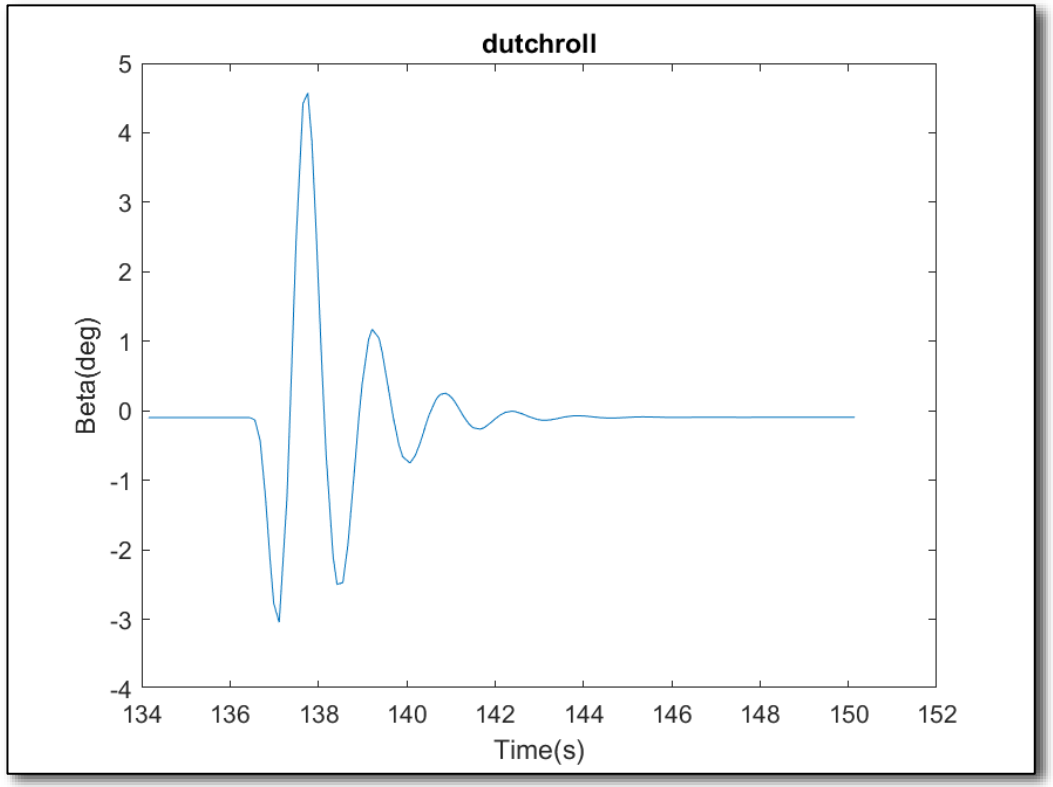
High Altitude High Speed [Mode H]

Low Altitude Low Speed [Mode L]

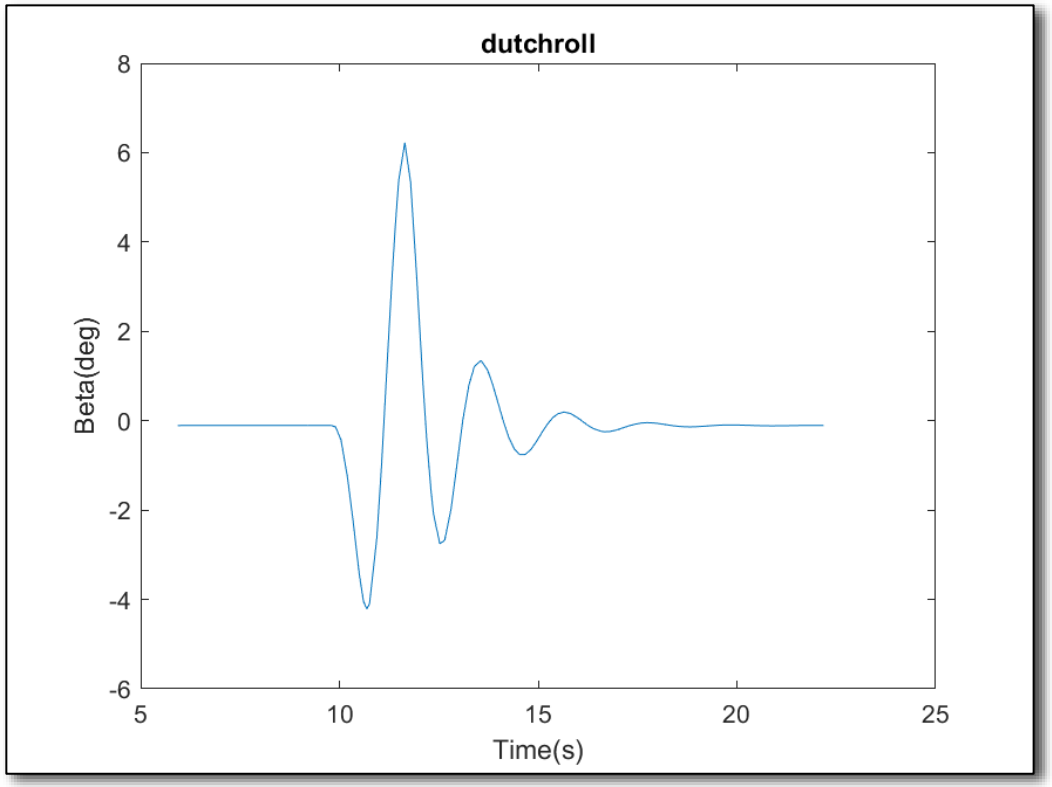
STABILITY TEST

Dutch Roll

[Mode H]



[Mode L]



Graph β vs Time