

Test Class

```

DownwashCalculator theDownwashCalculator = new DownwashCalculator(aircraft);
theDownwashCalculator.calculateDownwashNonLinearDelft();
double downwash = theDownwashCalculator.getDownwashAtAlphaBody(alphaBody);
theDownwashCalculator.plotDownwashDelftWithPath(subfolderPath);
theDownwashCalculator.plotDownwashGradientDelftWithPath(subfolderPath);
theDownwashCalculator.plotZDistanceWithPath(subfolderPath);
    
```

DownwashCalculator

Builder

It calculates all the necessary variables useful for the calculation of the downwash gradient and the distances.

calculateDownwashGradientConstantDelft(distVortexPlane)

Using the parameters calculated before, this method calculates the distance between the aerodynamic center of the horizontal tail and the zero lift line of the wing.

calculateDownwashNonLinearDelft()

This method fills the fields of downwash angle, downwash gradient, the distance along z axis between the horizontal tail and the vortex shed plane and body-relative angle of attack.

getDownwashAtAlphaBody(alphaBody)

It interpolates the value of downwash angle and angle of attack which field must be filled before

Step 0

This method calculates step by step the distance between the aerodynamic centre and the vortex plane

$$\epsilon = \frac{d\epsilon}{d\alpha_w}(\alpha_w - \alpha_{0_w})$$