## **Test Class**

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



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.

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

calculateDownwashNonLinearDelft()

getDownwashAtAlphaBody(alphaBody)

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

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.

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

Step 0