
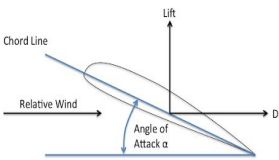


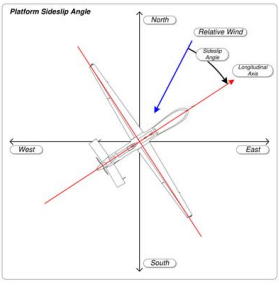
## Force Coefficients

Coefficient	Coefficient Name	Definition	Relative Information
$C_L$	Lift	Effectiveness of the airfoil to produce lift	Determined by the wings, fuselage, and horizontal tail. It varies with Mach and alpha.
$C_D$	Drag	The aerodynamic force that opposes an aircraft's motion through the air.	Generally presented as a function of the lift coefficient. 
$C_Y$	Sideforce	Force in the Y direction of the body.	Created by sideslipping motion (Beta not equal to 0) and rudder deflection.

## Moment Coefficients

Coefficient	Coefficient Name	Definition	Relative Information
$C_l$	Rolling Moment	The rotational moment about the longitudinal axis.	
$C_m$	Pitching Moment	The rotational moment about the y axis.	
$C_n$	Yawing Moment	The rotational moment about the z-axis.	

Coefficient	Coefficient Name	Definition	Relative Information
$\alpha$	Angle of Attack	The angle the chord line makes with the freestream velocity vector.	

$\beta$	Sideslip Angle	The aerodynamic state where an aircraft is moving somewhat sideways as well as forward relative to the oncoming airflow or relative wind.	 <p>The diagram, titled 'Platform Sideslip Angle', shows a top-down view of an aircraft's longitudinal axis (red line) and a reference axis (black line). The aircraft is oriented towards the North. A blue arrow labeled 'Relative Wind' points towards the aircraft from the North-East. A red arrow labeled 'Sideslip Angle' indicates the angle between the longitudinal axis and the relative wind. A black arrow labeled 'Longitudinal Axis' points along the aircraft's nose. The cardinal directions North, South, East, and West are marked with arrows.</p>
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#### Dimensionless Force Coefficient Equations

Coefficient	Equation	Relative Information
$C_L$	$C_L = \frac{C_L}{\bar{q}S}$	Wind-axis q bar = dynamic pressure S = wing planform area CL = lifting force
$C_D$	$C_D = \frac{C_D}{\bar{q}S}$	Wind-axis q bar = dynamic pressure S = wing planform area CD = Drag force
$C_Y$	$C_Y = \frac{C_C}{\bar{q}S}$	Wind-axis q bar = dynamic pressure S = wing planform area CC = sideforce

#### Dimensionless Moment Coefficient Equations

Coefficient	Equation	Relative Information
$C_l$	$l_w = \frac{R_M}{\bar{q}Sb_{ref}}$	Wind-axis q bar = dynamic pressure S = wing planform area RM = Rolling Moment Bref = wingspan
$C_m$	$m_w = \frac{P_M}{\bar{q}S\bar{c}}$	Wind-axis q bar = dynamic pressure S = wing planform area PM = Pitching Moment c bar = mean aerodynamic chord

$C_n$	$n_w = \frac{Y_m}{\bar{q} S b_{ref}}$	Wind-axis q bar = dynamic pressure S = wing planform area YM = Yawing Moment Bref = wingspan
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Coefficient	Equation	Relative Information
$\alpha$	$-\pi < \alpha < \pi$	Measured with the limits of -pi to pi because it is being measured or estimated on the z-axis.
$\beta$	$-\frac{\pi}{2} \leq \beta \leq \frac{\pi}{2}$	The sideslip angle does not have an equation but is measured with the two limits seen to the left. This is being measured on the y-axis.