# 1  MILO NOT SUKS Equations

Here are some example aerodynamic equations used in the analysis of flight dynamics:

## 1.1  Lift Equation

The lift force generated by an object is given by:

$$L = \frac{1}{2}\rho v^2 C_L A \tag{1}$$

where:

- $L$ is the lift force (N),
- $\rho$ is the air density (kg/m$^3$),
- $v$ is the velocity of the object relative to the air (m/s),
- $C_L$ is the lift coefficient (dimensionless),
- $A$ is the reference area (m$^2$).

## 1.2  Drag Equation

The drag force acting on an object is given by:

$$D = \frac{1}{2}\rho v^2 C_D A \tag{2}$$

where:

- $D$ is the drag force (N),
- $C_D$ is the drag coefficient (dimensionless).

## 1.3  Reynolds Number

The Reynolds number, a dimensionless quantity, is used to predict flow patterns in different fluid flow situations:

$$Re = \frac{\rho v L}{\mu} \tag{3}$$

where:

- $Re$ is the Reynolds number,
- $L$ is the characteristic length (m),
- $\mu$ is the dynamic viscosity of the fluid (Pa·s).

## 1.4 Bernoulli's Equation

Bernoulli's principle for incompressible flow is expressed as:

$$P + \frac{1}{2}\rho v^2 + \rho gh = \text{constant} \tag{4}$$

where:

- $P$ is the static pressure (Pa),
- $g$ is the acceleration due to gravity (m/s$^2$),
- $h$ is the height above a reference point (m).

## 1.5 Equation of Continuity

The equation of continuity for incompressible flow is:

$$A_1 v_1 = A_2 v_2 \tag{5}$$

where:

- $A_1$ and $A_2$ are the cross-sectional areas (m$^2$),
- $v_1$ and $v_2$ are the flow velocities (m/s).