

$$\dot{V} = \frac{1}{m}[-D \cos \beta + Y_A \sin \beta + X_T \cos \alpha \cos \beta - mg (\cos \alpha \cos \beta \sin \theta - \sin \beta \sin \phi \cos \theta - \sin \alpha \cos \beta \cos \phi \cos \theta)] \quad (2.1)$$

$$\dot{\alpha} = \frac{1}{mV \cos \beta}[-L - X_T \sin \alpha + mg (\cos \alpha \cos \phi \cos \theta + \sin \alpha \sin \theta)] + q - \tan \beta (p \cos \alpha + r \sin \alpha) \quad (2.2)$$

$$\dot{\beta} = \frac{1}{mV}[D \sin \beta - X_T \cos \alpha \sin \beta + mg (\cos \alpha \sin \beta \sin \theta + \cos \beta \sin \phi \cos \theta - \sin \alpha \sin \beta \cos \phi \cos \theta)] + p \sin \alpha - r \cos \alpha \quad (2.3)$$