

Small Angle Approximation

The following formulae are reasonably accurate when θ is small.

$$\sin \theta \approx \theta \tag{1}$$

$$\cos \theta \approx 1 - \frac{\theta^2}{2} \tag{2}$$

$$\tan \theta \approx \theta \tag{3}$$

The following equation is also often used for further simplification.

$$\theta^2 \approx 0 \tag{4}$$

This leads to

$$\cos \theta \approx 1 \tag{5}$$