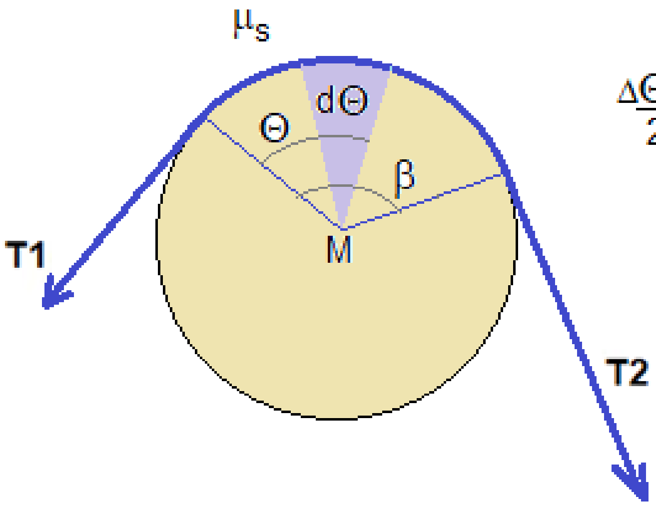


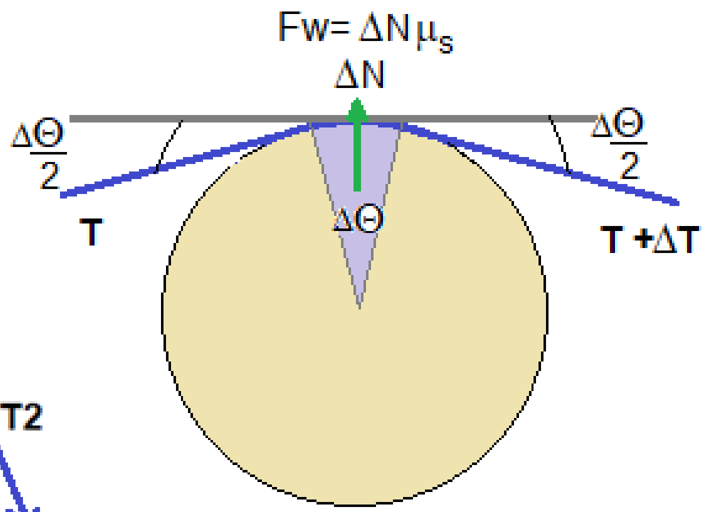


$$\sum Fx = 0 \quad (T+\Delta T)cos\frac{\Delta\Theta}{2} - Tcos\frac{\Delta\Theta}{2} - \Delta N\mu_s = 0$$

$$\Delta Tcos\frac{\Theta}{2} = \Delta N\mu_s \quad \Delta N = \frac{\Delta Tcos\frac{\Delta\Theta}{2}}{\mu_s}$$

$$\sum Fy = 0 \quad \Delta N - (T+\Delta T)sin\frac{\Delta\Theta}{2} - Tsin\frac{\Delta\Theta}{2} = 0$$

$$\Delta N = (T+\Delta T)sin\frac{\Delta\Theta}{2} + Tsin\frac{\Delta\Theta}{2} = 2Tsin\frac{\Delta\Theta}{2} + \Delta Tsin\frac{\Delta\Theta}{2}$$

$$\frac{\Delta Tcos\frac{\Delta\Theta}{2}}{\mu_s} = (2T+\Delta T)sin\frac{\Delta\Theta}{2}$$

$$\Delta Tcos\frac{\Delta\Theta}{2} - (2T+\Delta T)sin\frac{\Delta\Theta}{2}\mu_s = 0$$

$$\frac{\Delta T}{\Delta\Theta}\,cos\frac{\Delta\Theta}{2} - (2T+\Delta T)\frac{sin\frac{\Delta\Theta}{2}}{\Delta\Theta}\mu_s = 0$$

$$\frac{\Delta T}{\Delta\Theta}\,cos\frac{\Delta\Theta}{2} - \left(T+\frac{1}{2}\Delta T\right)\frac{sin\frac{\Delta\Theta}{2}}{\frac{\Delta\Theta}{2}}\mu_s$$

$$\lim_{\Delta T\to 0,\Delta\Theta\to 0}\left(\frac{\Delta T}{\Delta\Theta}\,cos\frac{\Delta\Theta}{2} - \left(T+\frac{1}{2}\Delta T\right)\frac{sin\frac{\Delta\Theta}{2}}{\frac{\Delta\Theta}{2}}\mu_s = 0\right)$$

$$\frac{dT}{d\Theta}(1) - (T+0)(1)\mu_s = 0$$

$\frac{dT}{d\Theta} - T\mu_s = 0$ (oplossen door scheiding van variabelen)

$dT = T\mu_s d\Theta$

$$\frac{dT}{T} = \mu_s d\Theta$$

$$\int \frac{dT}{T} = \int \mu_s d\Theta$$

$\int_{T1}^{T2} \frac{dT}{T} = lnT|\begin{matrix} T2 \\ T1 \end{matrix} = lnT2 - lnT1 = ln\frac{T2}{T1} = \mu_s \Theta|\begin{matrix} \beta \\ 0 \end{matrix} = \mu_s\beta|$

$$\frac{T2}{T1} = e^{\mu_s\beta}$$

$\mu_s = 0{,}2$

$T2 = T1.\, e^{\mu_s\beta} = 800(1.3691) = 1095{,}286N$

$800 = T2.\, e^{\mu_s\beta}$

$$T2 = \frac{800}{e^{\mu_s\beta}} = 584{,}325N$$

$T_{min} < T_{rapunzel} < T_{max}$ voor equilibrium

$584{,}325N < T_{rapunzel} < 1095{,}286N$