1 Vorwärtsproblem

$$h_r = \sqrt{l_e^2 + h_m^2 - 2 l_e h_m \cdot cos(\phi)}$$

$$\alpha = arcsin\left(l_e \cdot \frac{sin(\phi)}{h_r}\right)$$

$$\beta = \pi - \alpha - \psi$$

$$h = sin(\phi) \cdot \frac{h_b}{sin(\beta)}$$

$$\gamma = arcsin(\frac{l_r}{h_r})$$

$$\delta = \pi - \beta - \gamma$$

$$b_{bottom} = \frac{sin(\gamma)}{sin(\delta)} \cdot h$$

$$\epsilon = \pi - \beta$$

$$\zeta = \pi - \epsilon - \gamma$$

$$b_{top} = \frac{sin(\gamma)}{sin(\zeta)} \cdot h$$

$$b = b_{top} + b_{bottom}$$

$$b(l_r, l_e, h_m, h_b, \phi,$$

$$\left(\frac{sin\left(arcsin\left(\frac{l_e * sin(\phi)}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}} \right) + \psi \right)}{sin(-arcsin(\frac{l_r}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}}) + \pi - arcsin(\frac{l_e * sin(\phi)}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}})} \right.$$

$$+ \frac{\frac{l_r}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}}}{sin(-arcsin(\frac{l_r}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}}) + arcsin(\frac{l_e * sin(\phi)}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}}) +$$

$$\left. \cdot \left(\frac{sin(\phi) * h_b}{sin(\pi - arcsin(\frac{l_e * sin(\phi)}{\sqrt{l_e^2 + h_m^2 - 2 * l_e * h_m * cos(\phi)}}) - \right. \right.$$

$$+\frac{\left[\frac{}{-sin(-arcsin(\frac{}{\sqrt{l_e^2+h_m^2-2*}}\right.}}{\frac{1}{2}*\left(\sqrt{1-\left(\frac{l_r}{\sqrt{l_e^2+h_m^2-2*l_e*h_m*cos(\phi)}}\right)^2}-cos(2*arcsin(\frac{l_e*sin(\phi)}{\sqrt{l_e^2+h_m^2-2*l_e*h_m*c}}\right.}$$

$$\left[\frac{1}{-\sqrt{1-\left(\frac{l_r}{\sqrt{l_e^2+h_m^2-2l_eh_m\cdot cos(\phi)}}\right)^2}+cos(2*arcsin(\frac{l_e*sin(\phi)}{\sqrt{l_e^2+h_m^2-2l_eh_m\cdot cos(}}\right.$$

$$+\frac{1}{\sqrt{1-\left(\frac{l_r}{\sqrt{l_e^2+h_m^2-2*l_e*h_m*cos(\phi)}}\right)^2}-cos(2*arcsin(\frac{l_e*sin(\phi)}{\sqrt{l_e^2+h_m^2-2*l_e*h_m*cos(\phi)}})}$$

$$\cdot\left(2*\frac{}{\sqrt{l_e^2-}}\right.$$