Φ °

v constant
h ∝ v²

ℓ_ℓ

γ °

$\mathcal{R}_{aa}$

$\mathcal{R}_{al}$

$\mathcal{R}_{wa}$

$\mathcal{R}_\ell$

$\mathcal{R}_{wl}$

γ °

h

$\mathcal{L}_{aa}$

$\mathcal{L}_{al}$

$\mathcal{L}_{wl}$

$\mathcal{L}_{wa}$

$\mathcal{L}_\ell$

$(90-Φ)°$ $(90-Φ-γ)°$

Note: currently, all moments go through top red dot: we need to transform the center of moment down to the actual cg

$$\mathcal{L}_{aa} = \ell_\ell + \frac{\mathcal{L}_{al}}{2}$$

$$\mathcal{L}_{wa} = \ell_\ell + \mathcal{L}_{al} + \frac{\mathcal{L}_{wl}}{2}$$

$$\mathcal{L}_{wl} = \mathcal{L}_\ell - \mathcal{L}_{al} - \ell_\ell$$

$$\mathcal{R}_{aa} = \ell_\ell + \frac{\mathcal{R}_{al}}{2}$$

$$\mathcal{R}_{wa} = \ell_\ell + \mathcal{R}_{al} + \frac{\mathcal{R}_{wl}}{2}$$

$$\mathcal{R}_{wl} = \mathcal{R}_\ell - \mathcal{R}_{al} - \ell_\ell$$

$$\mathcal{R}_{al} = \frac{h}{\cos(\gamma+Φ)} - \ell_\ell$$

$$\mathcal{L}_{al} = \frac{h}{\sin(90-\gamma-Φ)} - \ell_\ell$$

Φ > 0° in left bank
L_{al} & R_{al} switch when Φ < 0°