Θ

Φ

L1

L2

L3

M1

M2

For stability to be maintained, the center of mass must be directly above the Y-axis:

This implies:

Using small angle approximation:

For L3 (assuming L1=L2):

Using small angle approximation:

Everything but Θ and L3 are known in these equations. The idea is that we will be able to measure Φ and be able to calculate a Θ such that the horizontal component of M2L3 will cancel with the horizontal component of M1L1.