Da $$\frac{\partial \mathcal{H}^*}{\partial q} = \frac{\partial \mathcal{H}}{\partial q} + \frac{\partial \mathcal{H}}{\partial \Theta}\frac{\partial \Theta}{\partial q} + \frac{\partial \mathcal{H}}{\partial \Theta'}\frac{\partial \Theta'}{\partial q} + \frac{\partial \mathcal{H}}{\partial w}\frac{\partial w}{\partial q}$$

ist, so folgt zunächst

$$\frac{dq}{dt} = -\frac{\partial \mathcal{H}^*}{\partial q} + \left(\frac{\partial \mathcal{H}}{\partial \Theta}\frac{\partial \Theta}{\partial q} + \frac{\partial \mathcal{H}}{\partial \Theta'}\frac{\partial \Theta'}{\partial q} + \frac{\partial \mathcal{H}}{\partial w}\frac{\partial w}{\partial q}\right)$$

Nehmen wir aber als x_1, x_2 = Ebene die invariable Ebene, so wird $a = b = 0$. Daraus folgt

$$w = 180^\circ, \quad \sqrt{q^2 - \Theta^2} = \sqrt{q'^2 - \Theta'^2}$$

$$\Theta + \Theta' = c, \quad \Theta - \Theta' = \frac{q^2 - q'^2}{c}$$

Unsere drei Funktionen Θ, Θ' und w werden also

$$\Theta = \frac{1}{2c}(c^2 + q^2 - q'^2)$$

$$\Theta' = \frac{1}{2c}(c^2 - q^2 + q'^2)$$

$$w = 180^\circ$$

Daraus folgt

$$\frac{\partial w}{\partial q} = 0, \quad \frac{\partial \Theta}{\partial q} = -\frac{\partial \Theta'}{\partial q}, \quad \frac{\partial \Theta}{\partial q'} = -\frac{\partial \Theta'}{\partial q'}$$

Aber aus $\vartheta - \vartheta' = 180^\circ$ folgt

$$0 = \frac{d\vartheta}{dt} - \frac{d\vartheta'}{dt} = \frac{\partial \mathcal{H}}{\partial \Theta} - \frac{\partial \mathcal{H}}{\partial \Theta'}$$

Demnach ist

$$\frac{\partial \mathcal{H}}{\partial \Theta}\frac{\partial \Theta}{\partial q} + \frac{\partial \mathcal{H}}{\partial \Theta'}\frac{\partial \Theta'}{\partial q} + \frac{\partial \mathcal{H}}{\partial w}\frac{\partial w}{\partial q} = \frac{\partial \Theta}{\partial q}\left(\frac{\partial \mathcal{H}}{\partial \Theta} - \frac{\partial \mathcal{H}}{\partial \Theta'}\right) = 0.$$