

a canonical transformation by a generating function:

$$G(x_1, p_{x2}, y_1, p_{y2}, p_1) = H_0(x_1, p_{x2}, y_1, p_{y2}, p_1) + \frac{1}{2} \left( \frac{\partial H_0}{\partial x_1} \frac{\partial H_0}{\partial p_{x2}} + \frac{\partial H_0}{\partial y_1} \frac{\partial H_0}{\partial p_{y2}} \right),$$

where

$$H_0 = p_{x2}\Delta x_1 + p_{y2}\Delta y_1 \, ,$$

$$\Delta x_1 = x_1(a/3 + b) \, ,$$

$$\Delta y_1 = -y_1(a + b/3) \, ,$$

$$a = -\text{K1} \frac{x_1^2}{4p_1} \, ,$$

$$b = -\text{K1} \frac{y_1^2}{4p_1} \, .$$