(6.1)の導出

$$\beta = 2\Omega \frac{d\theta}{dy}\frac{d}{d\theta}\sin\theta$$

$\Delta y = a\Delta\theta$　より

$$\beta = 2\Omega \frac{1}{a}\frac{d}{d\theta}\sin\theta$$

微分を実行して

$$\beta = 2\Omega \frac{1}{a}\cos\theta \qquad (6.1)$$

(6.2)の導出

クロス微分(∂②/ ∂x – ∂①/ ∂y)より

$$f(u_x + v_y) + f_y v = \frac{1}{\rho_0 H}\left(\frac{\partial}{\partial x}\tau^y - \frac{\partial}{\partial y}\tau^x\right)$$

③を代入して

$$f_y v = \frac{1}{\rho_0 H}\left(\frac{\partial}{\partial x}\tau^y - \frac{\partial}{\partial y}\tau^x\right)$$

$\beta = df/dy$を使い，両辺にHをかけると

$$\beta v H = \frac{1}{\rho_0}\left(\frac{\partial}{\partial x}\tau^y - \frac{\partial}{\partial y}\tau^x\right) \qquad (6.2)$$