

## Erratum

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the date of receipt and acceptance should be inserted later

This erratum concerns the appendix of the paper *High-order h-adaptive discontinuous Galerkin methods for ocean modeling*, Ocean Dynamics, 57, 109-121.

Although presented only for completeness and not being used in our computations the analytical stream function  $\Psi$  of the Stommel gyre test case given in the appendix on page 120 is wrong. The non dimensional function  $\mathcal{D}^3$  should read  $\mathcal{D}$  while the velocity and water elevation remain unchanged. The analytical Stommel gyre solution then reads :

$$\Psi(x, y) = \frac{\mathcal{D}\tau_0 L_y}{\pi^2 \gamma \rho} f_1(x) \cos(\pi y)$$

$$U(x, y) = \frac{\mathcal{D}\tau_0}{\pi \gamma \rho} f_1(x) \sin(\pi y)$$

$$V(x, y) = \frac{\mathcal{D}\tau_0}{\pi \gamma \rho \delta} f_2(x) \cos(\pi y)$$

$$\eta(x, y) = \frac{\mathcal{D}\tau_0 f_0 L_x}{\pi \gamma \rho \delta g h} \left[ -\frac{\gamma}{f_0 \delta \pi} f_2(x) \sin(\pi y) + \frac{1}{\pi} f_1(x) \left( \cos(\pi y)(1 + \beta y) - \frac{\beta}{\pi} \sin(\pi y) \right) \right]$$

with the following functions :

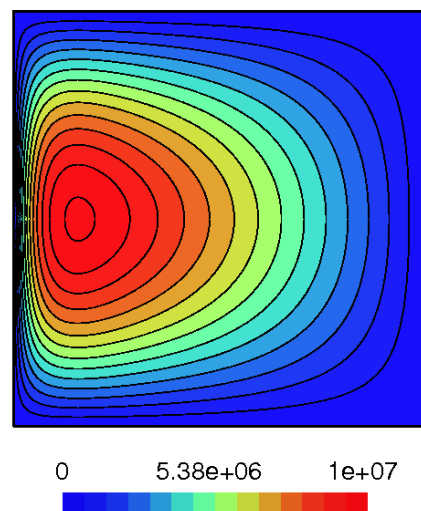
$$f_1(x) = \frac{\pi}{\mathcal{D}} \left( 1 + \frac{(e^{z_2} - 1)e^{xz_1} + (1 - e^{z_1})e^{xz_2}}{e^{z_1} - e^{z_2}} \right)$$

$$f_2(x) = \frac{1}{\mathcal{D}} \frac{(e^{z_2} - 1)z_1 e^{xz_1} + (1 - e^{z_1})z_2 e^{xz_2}}{e^{z_1} - e^{z_2}}$$

$$\mathcal{D} = \frac{(e^{z_2} - 1)z_1 + (1 - e^{z_1})z_2}{e^{z_1} - e^{z_2}}$$

$$z_2^1 = \frac{-1 \pm \sqrt{1 + (2\pi\delta\epsilon)^2}}{2\epsilon}$$

and with  $x$  and  $y$  the non dimensionnal axis  $x \in [0 \ 1]$  and  $y \in [-0.5 \ 0.5]$ . The dimensionless parameters used are the aspect ratio of the domain  $\delta = \frac{L_x}{L_y}$  and  $\epsilon = \frac{\gamma}{L_x \beta}$  the parameter defining the boundary layer width.



**Fig. 1.** Isolines of the stream function  $\Psi(x, y)$  obtained for the Stommel model. Notice that  $\Psi$  is the stream function of the transport so the units read  $m^3 s^{-1}$ . The following standard parameters are used :  $f_0 = 10^{-4} s^{-1}$ ,  $\beta = 2 \cdot 10^{-11} m^{-1} s^{-1}$ ,  $\tau_0 = 10^{-1} Nm^{-2}$ ,  $\gamma = 10^{-6} s^{-1}$ ,  $g = 10 ms^{-2}$ ,  $h = 10^3 m$ ,  $\rho = 10^3 kgm^{-3}$  and  $L_x = L_y = 10^6 m$  the length of the domain along the  $x$  and  $y$  dimensions.

This correction on the stream function expression requires a modification of figure 5 on page 115. The corrected function is depicted in figure ??.

We would like to thank the students of J.-O. Wolff and K. Lettmann at the University of Oldenburg who found this error during an exercise in their class on theoretical oceanography.