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The ISMIP-HOM benchmark experiments performed using the Finite-Element code Elmer.

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The complementary material attached to the paper *The ISMIP-HOM benchmark experiments performed using the Finite-Element code Elmer* by Gagliarini and Zwinger contains:
- the figures of all the outputs for the 6 ISMIP-HOM experiments performed with Elmer (this pdf file),
- the output data for the 6 ISMIP-HOM experiments performed with Elmer. For each experiments, an output ASCII text file is provided. The name of the file indicates which experiment results it contains, using the following coding: `oga1ELLL.txt`, where
`oga1` is the three letter code of the first author name of this work and the model number, as used in the presentation of the results in Pattyn et al. (2008),
`E` is the experiment number: a, b, c, d, e or f
`LLL` are three numbers denoting the length L (km) of the domain, *i.e.* 160, 080, 040, 020, 010 or 005. For experiment E, this becomes 000 for the standard non-sliding experiment and 001 for the experiment with the zone with pure sliding. For experiment F, this denotes the slip ratio, *i.e.* 000 or 001.
For each experiment, the output variables and their units are given in Table 1.

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Table 1. Description of the columns of the output files `oga1ELLL.txt` for the different experiments. The number of lines depends on the grid resolution used. The scaled coordinates $\hat{x} = x/L$ and $\hat{y} = y/L$ vary between 0 and 1. All variables are taken either at the surface z_s or at the bed z_b. The units are ma^{-1} for velocity u_i, kPa for stress τ_{ij} and pressure.

Exp.	File	1	2	3	4	5	6	7	8	9	10
A	`oga1aLLL.txt`	$\hat{x}$	$\hat{y}$	$u_x(z_s)$	$u_y(z_s)$	$u_z(z_s)$	$\tau_{xz}(z_b)$	$\tau_{yz}(z_b)$	$\Delta p(z_b)$		
B	`oga1bLLL.txt`	$\hat{x}$	$u_x(z_s)$	$u_z(z_s)$	$\tau_{xz}(z_b)$	$\Delta p(z_b)$					
C	`oga1cLLL.txt`	$\hat{x}$	$\hat{y}$	$u_x(z_s)$	$u_y(z_s)$	$u_z(z_s)$	$u_x(z_b)$	$u_y(z_b)$	$\tau_{xz}(z_b)$	$\tau_{yz}(z_b)$	$\Delta p(z_b)$
D	`oga1dLLL.txt`	$\hat{x}$	$u_x(z_s)$	$u_z(z_s)$	$u_x(z_b)$	$\tau_{xz}(z_b)$	$\Delta p(z_b)$				
E	`oga1eLLL.txt`	$\hat{x}$	$u_x(z_s)$	$u_z(z_s)$	$\tau_{xz}(z_b)$	$\Delta p(z_b)$					
F	`oga1fLLL.txt`	x	y	z_s	$u_x(z_s)$	$u_y(z_s)$	$u_z(z_s)$				

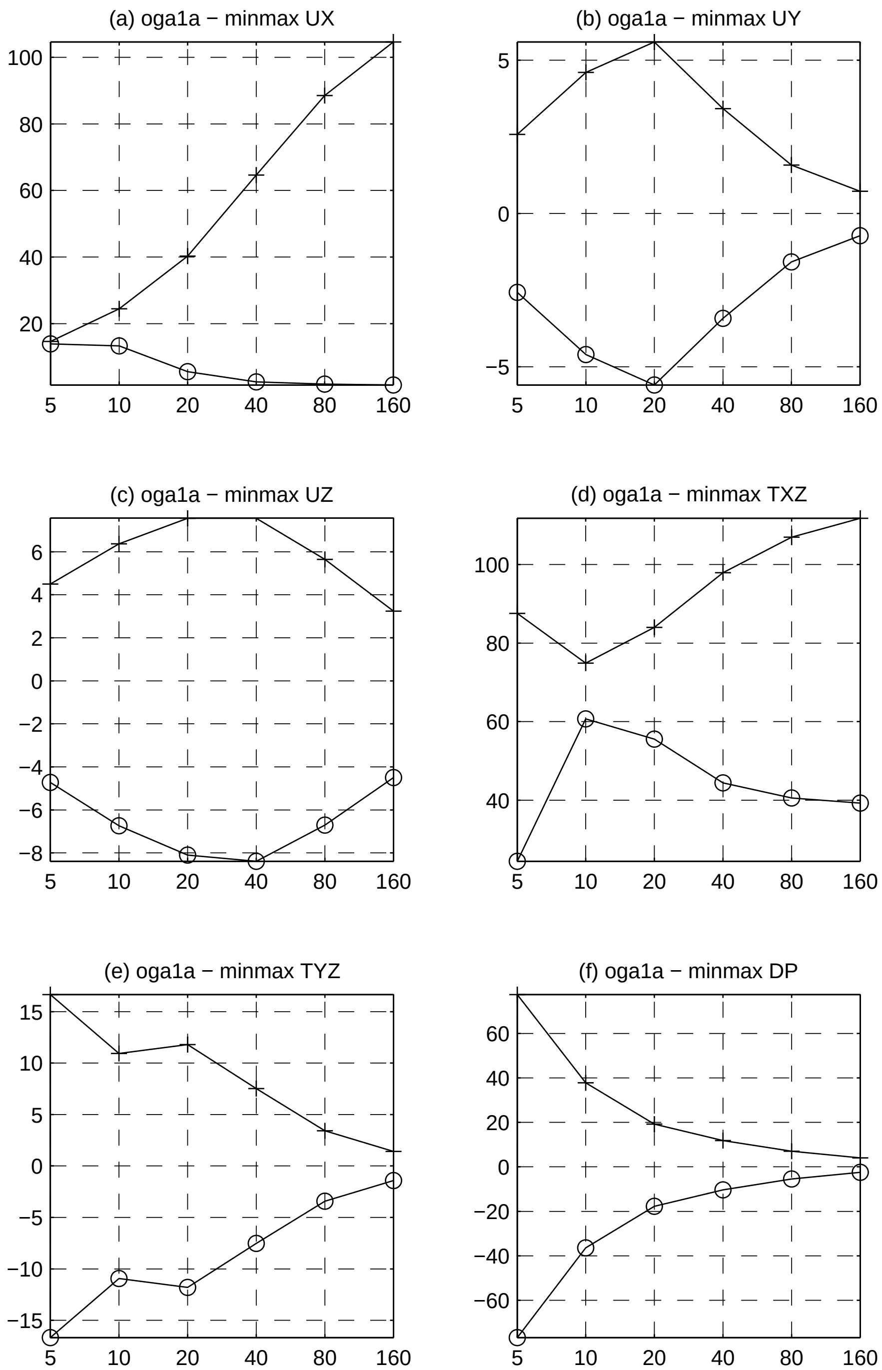

Fig. 1. Experiment A - Minimal and maximal values of the horizontal surface velocities **(a)** $u_x(z_s)$ and **(b)** $u_y(z_s)$, **(c)** vertical surface velocity $u_z(z_s)$, basal shear stresses **(d)** $\tau_{xz}(z_b)$ and **(e)** $\tau_{yz}(z_b)$ and **(f)** the difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ as a function of the domain length L (km). See Table 1 for the description of the different variables and the units.

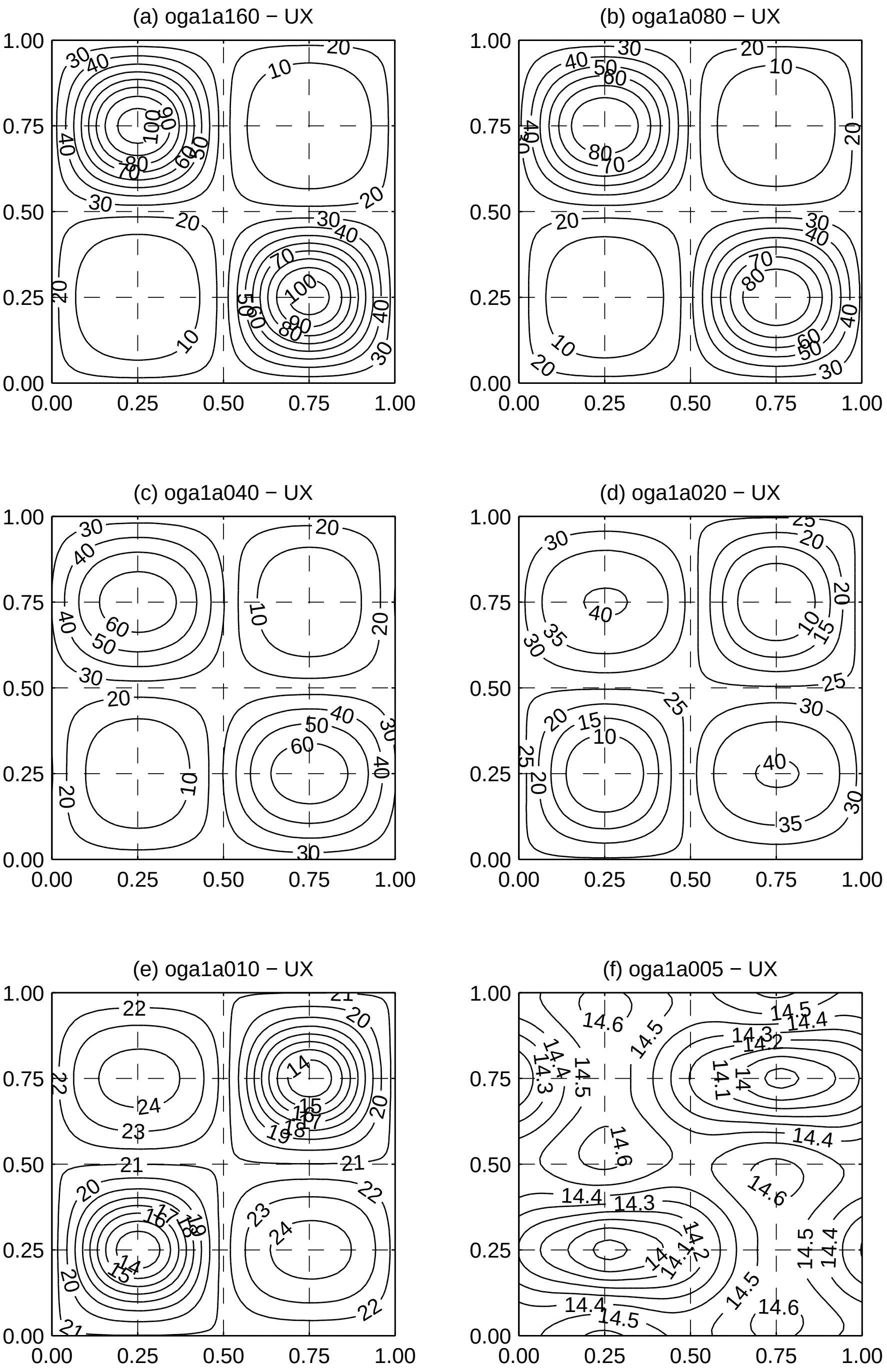

Fig. 2. Experiment A - Horizontal surface velocity $u_x(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

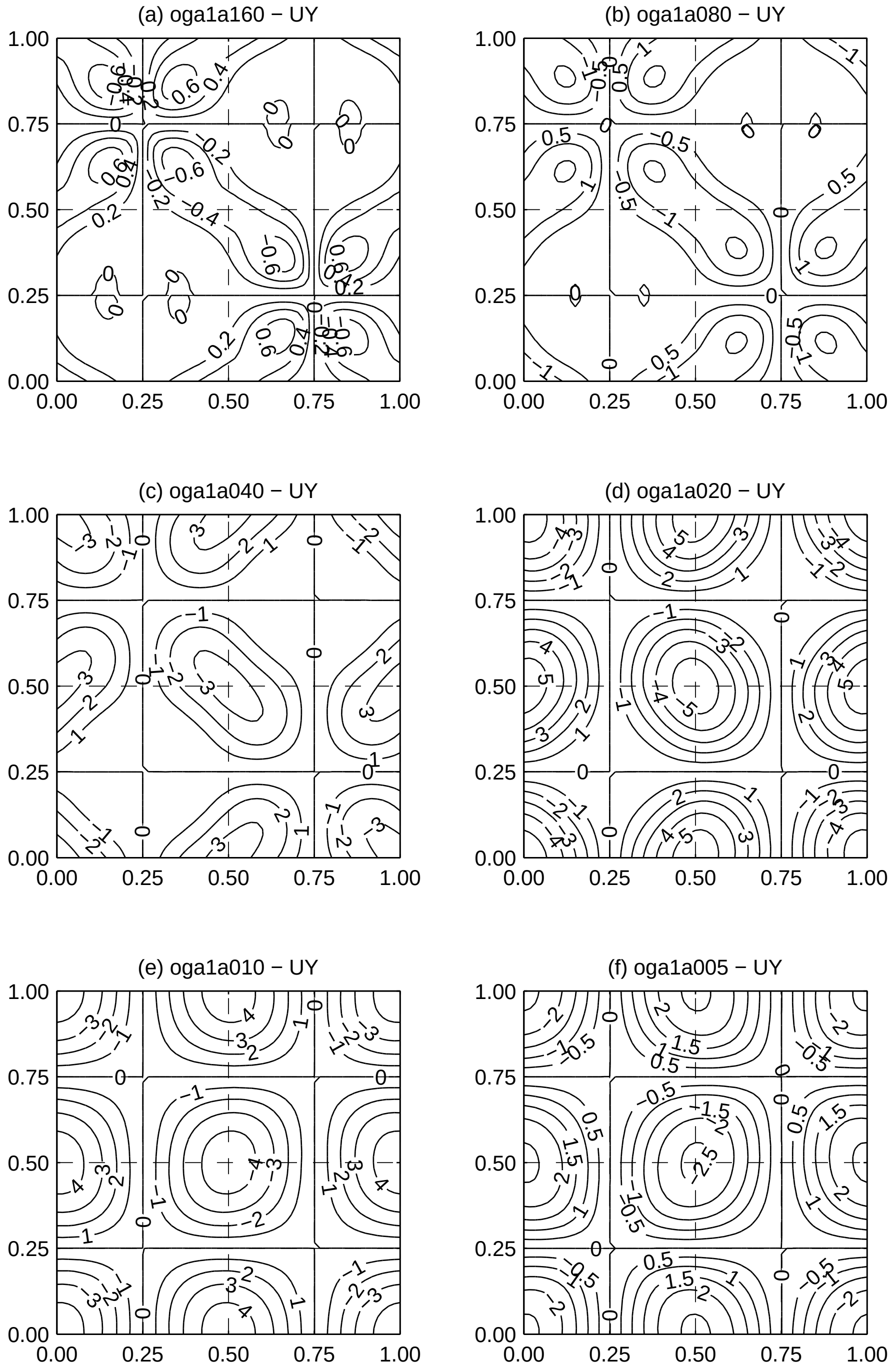

Fig. 3. Experiment A - Horizontal surface velocity $u_y(z_s)$ [ma^{-1}] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

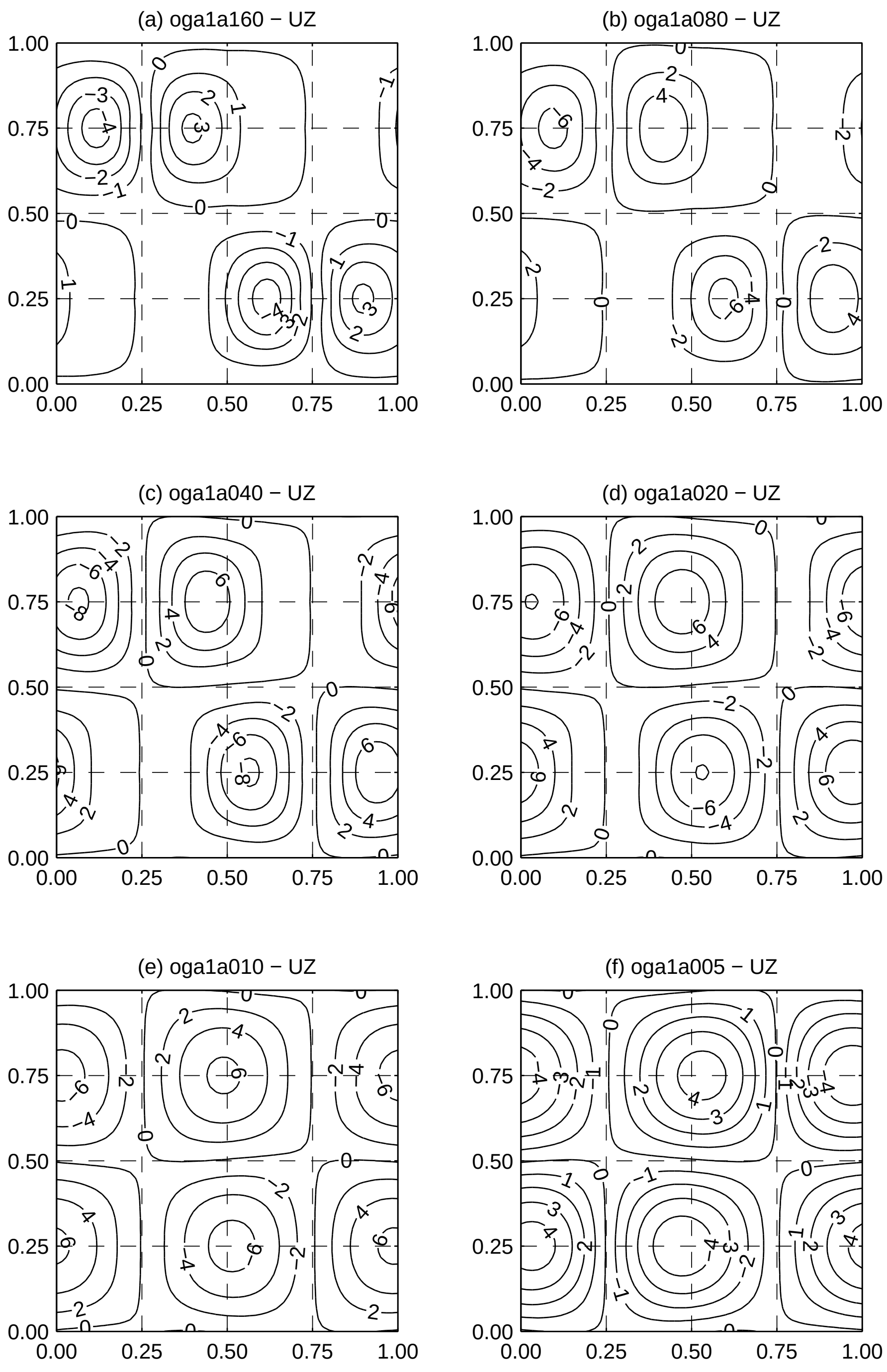

Fig. 4. Experiment A - Vertical surface velocity $u_z(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

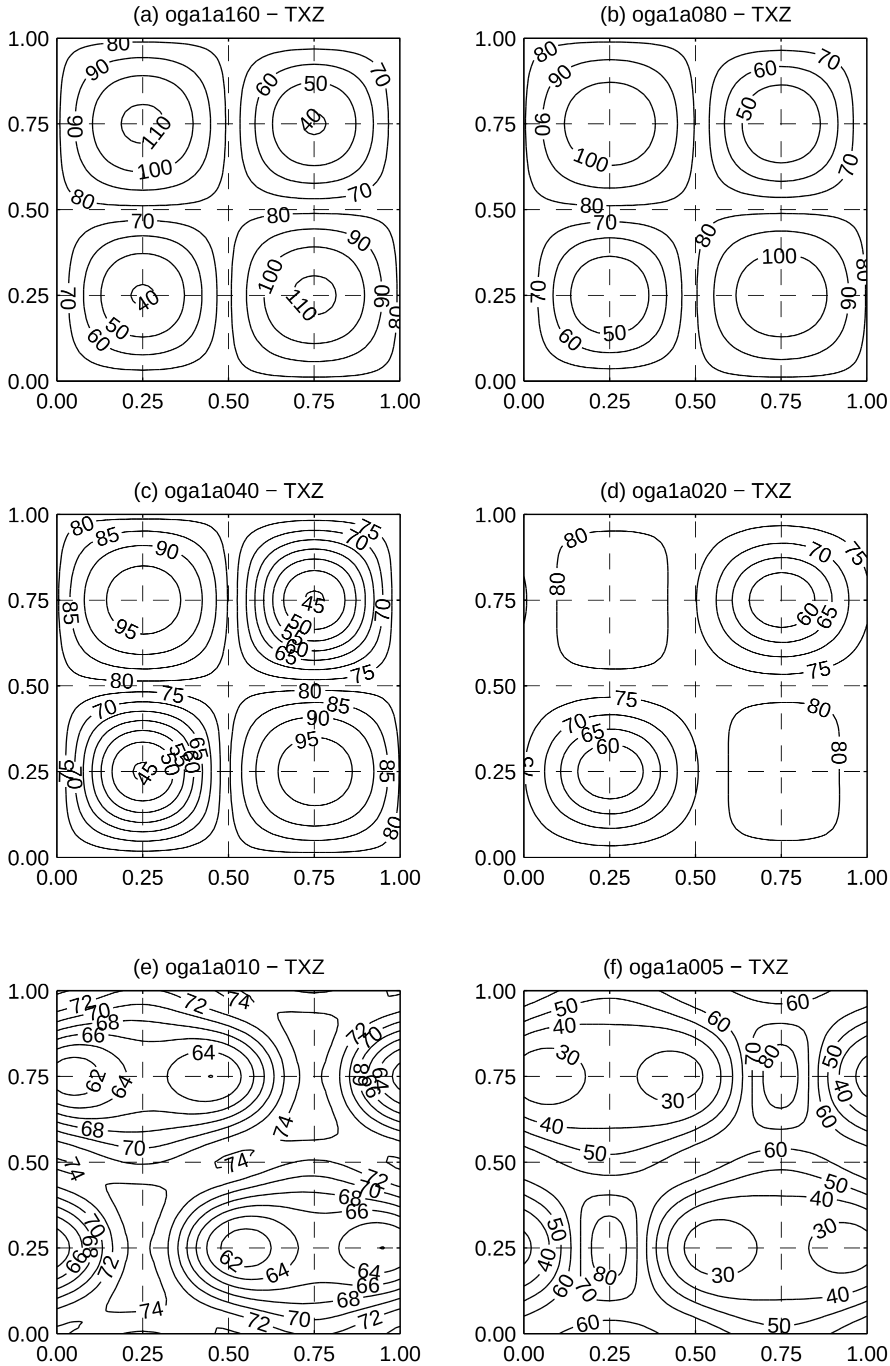

Fig. 5. Experiment A - Basal shear stress $\sigma_{xz}(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

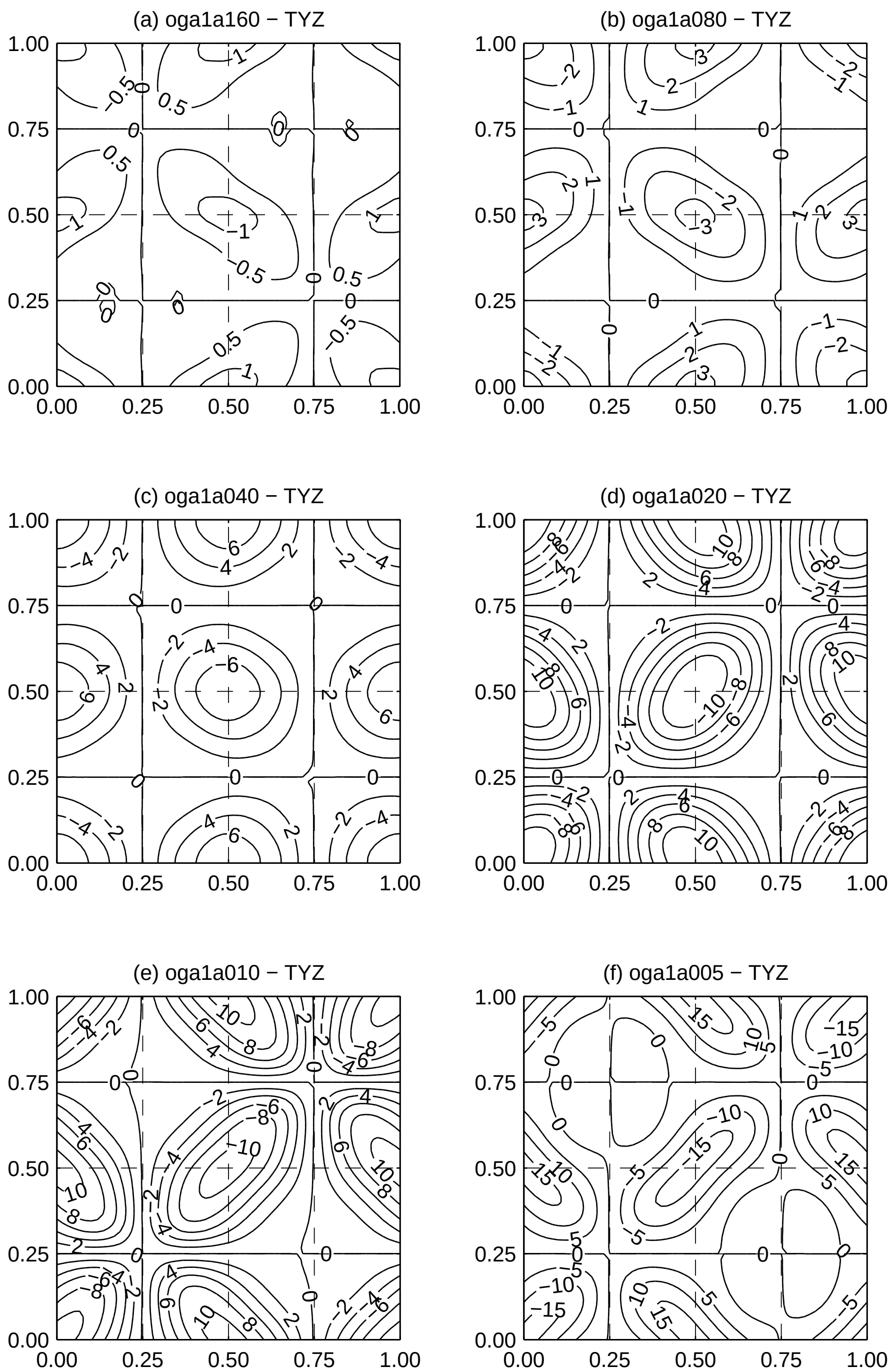

Fig. 6. Experiment A - Basal shear stress $\sigma_{yz}(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

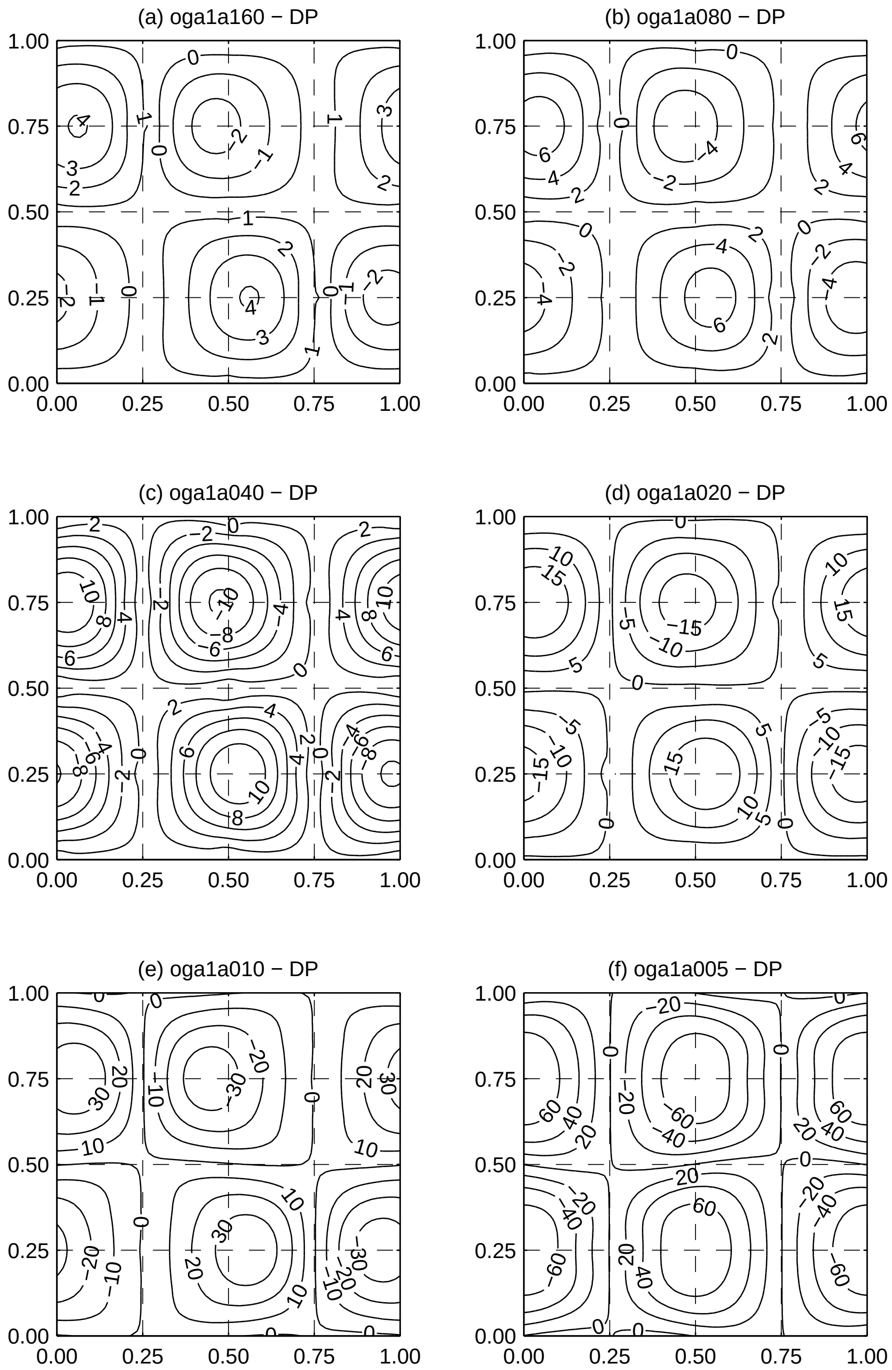

Fig. 7. Experiment A - Difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

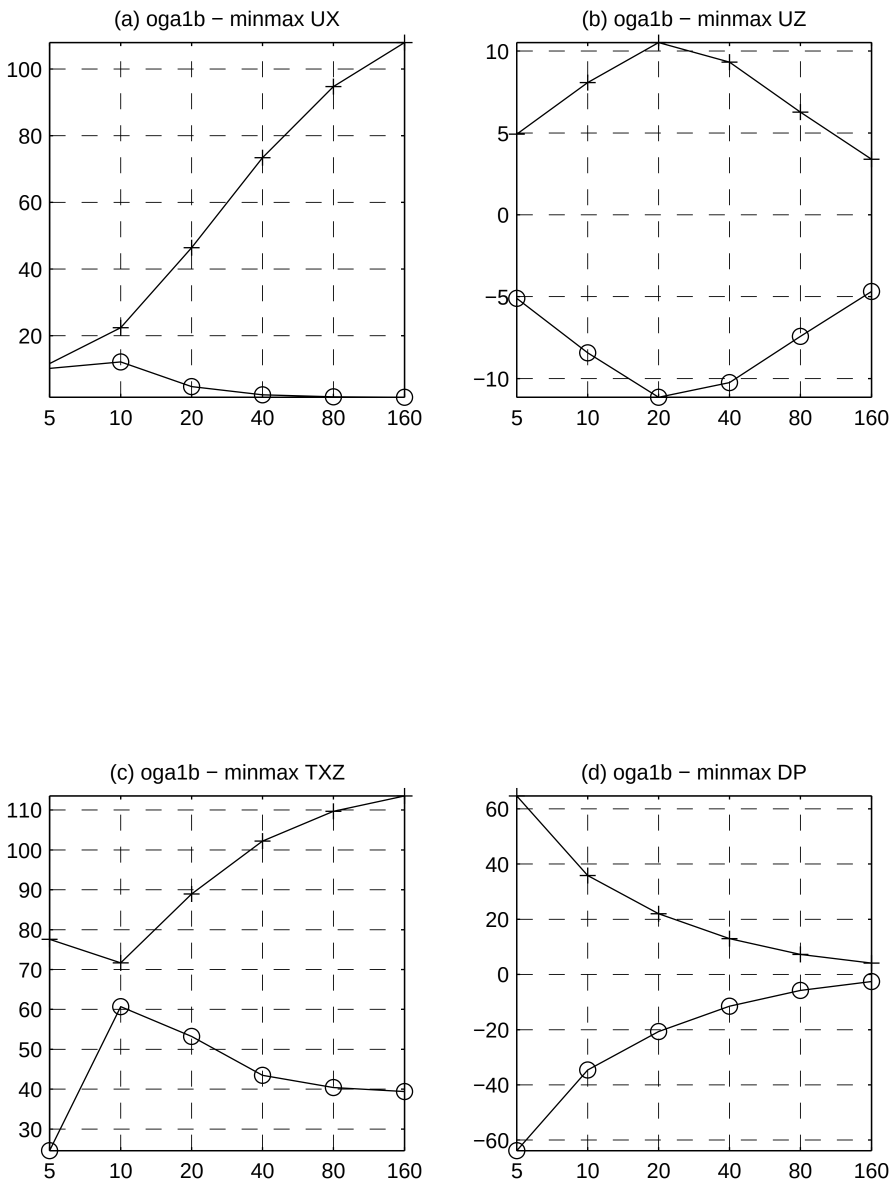

Fig. 8. Experiment B - Minimal and maximal values of **(a)** the horizontal surface velocity $u_x(z_s)$, **(b)** the vertical surface velocity $u_z(z_s)$, **(c)** the basal shear stress $\tau_{xz}(z_b)$ and the difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ as a function of the domain length L (km). See Table 1 for the description of the different variables and the units.

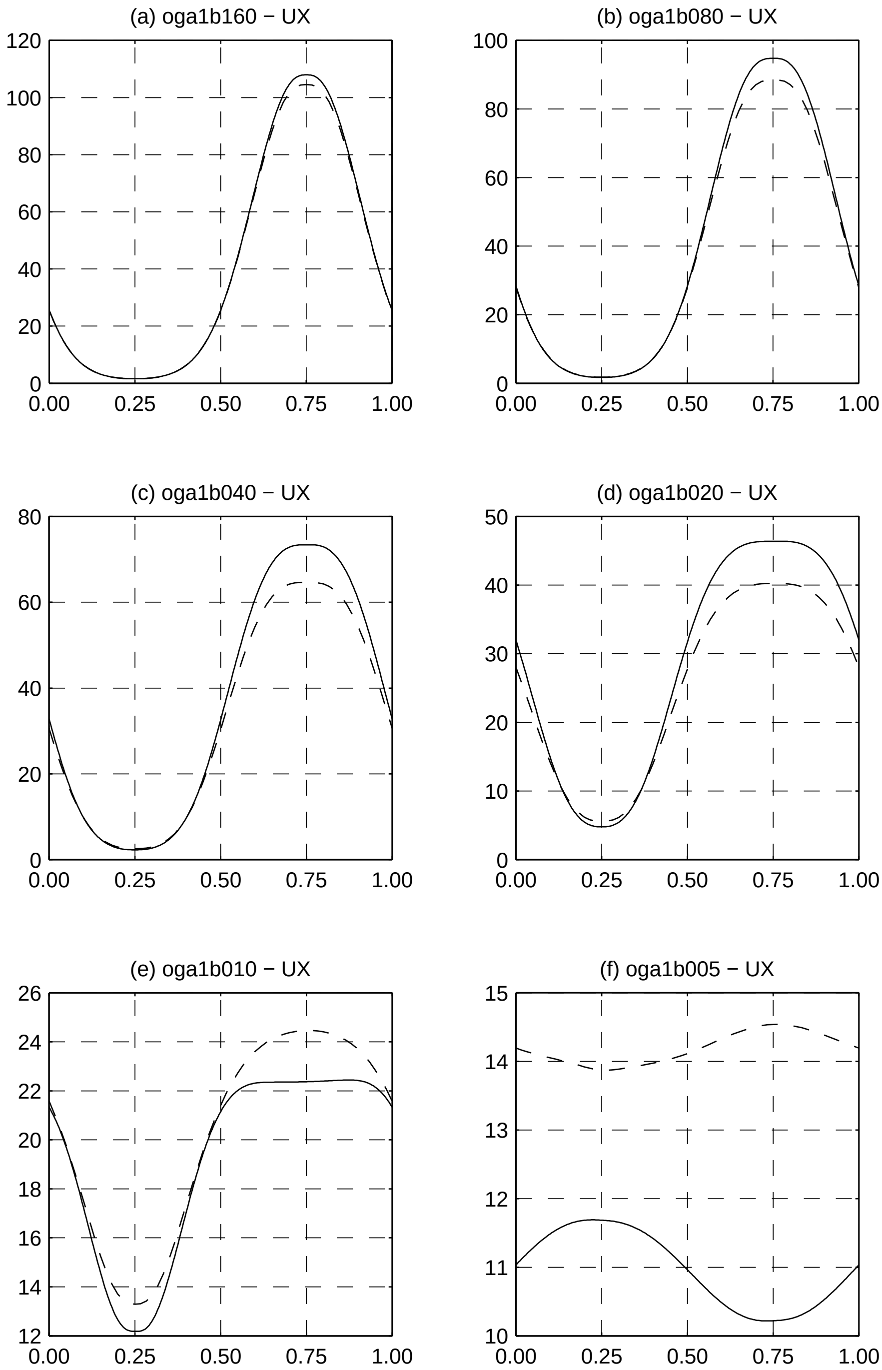

Fig. 9. Horizontal surface velocity $u_x(x, z_s)$ for Experiment B (solid line) and $u_x(x, L/4, z_s)$ for Experiment A (dashed line) $[\mathrm{ma}^{-1}]$ as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

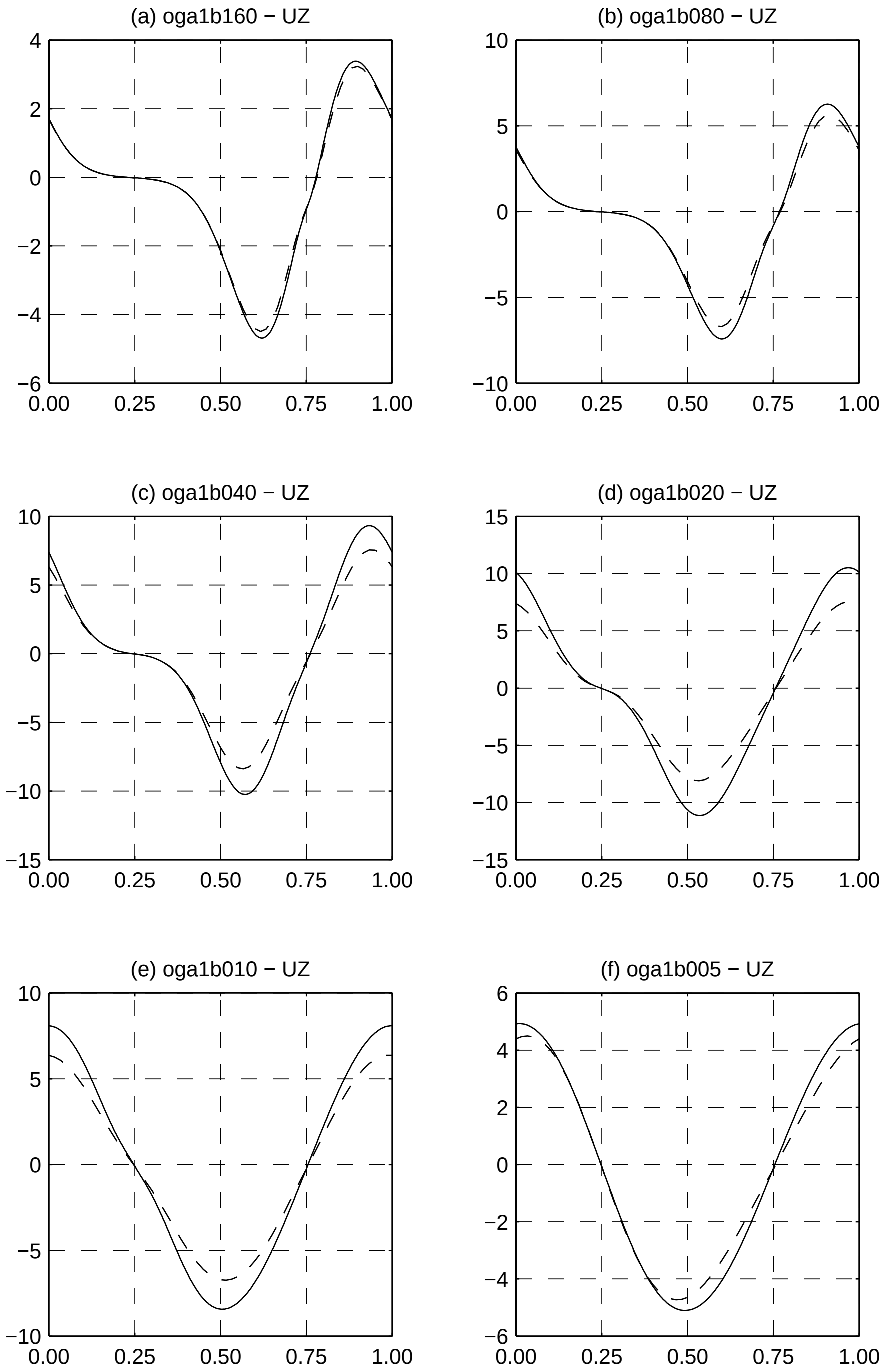

Fig. 10. Vertical surface velocity $u_z(x, z_s)$ for Experiment B (solid line) and $u_z(x, L/4, z_s)$ for Experiment A (dashed line) $[\mathrm{ma}^{-1}]$ as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

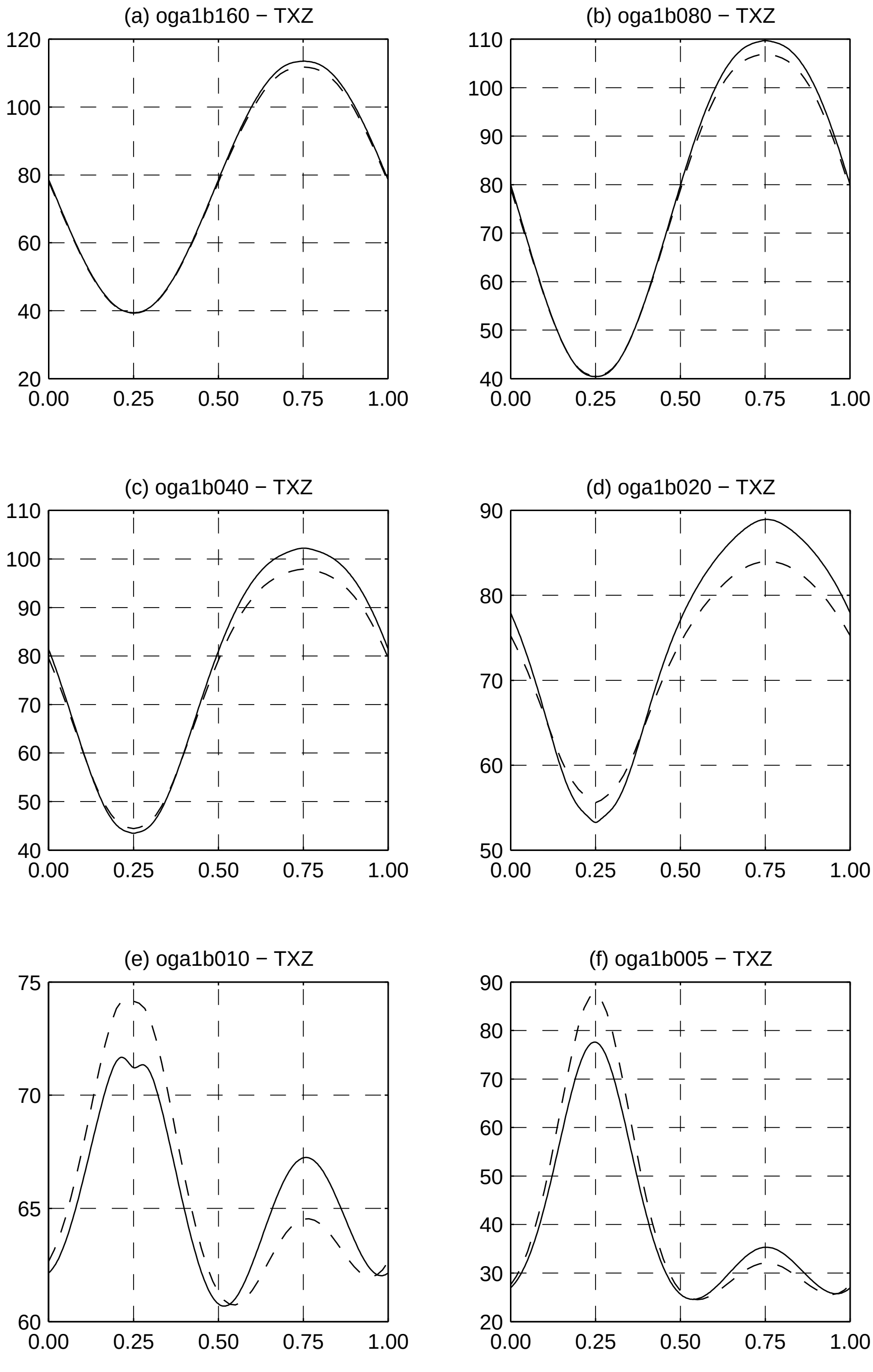

Fig. 11. Basal shear stress $\sigma_{xz}(x, z_s)$ for Experiment B (solid line) and $\sigma_{xz}(x, L/4, z_s)$ for Experiment A (dashed line) [kPa] as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

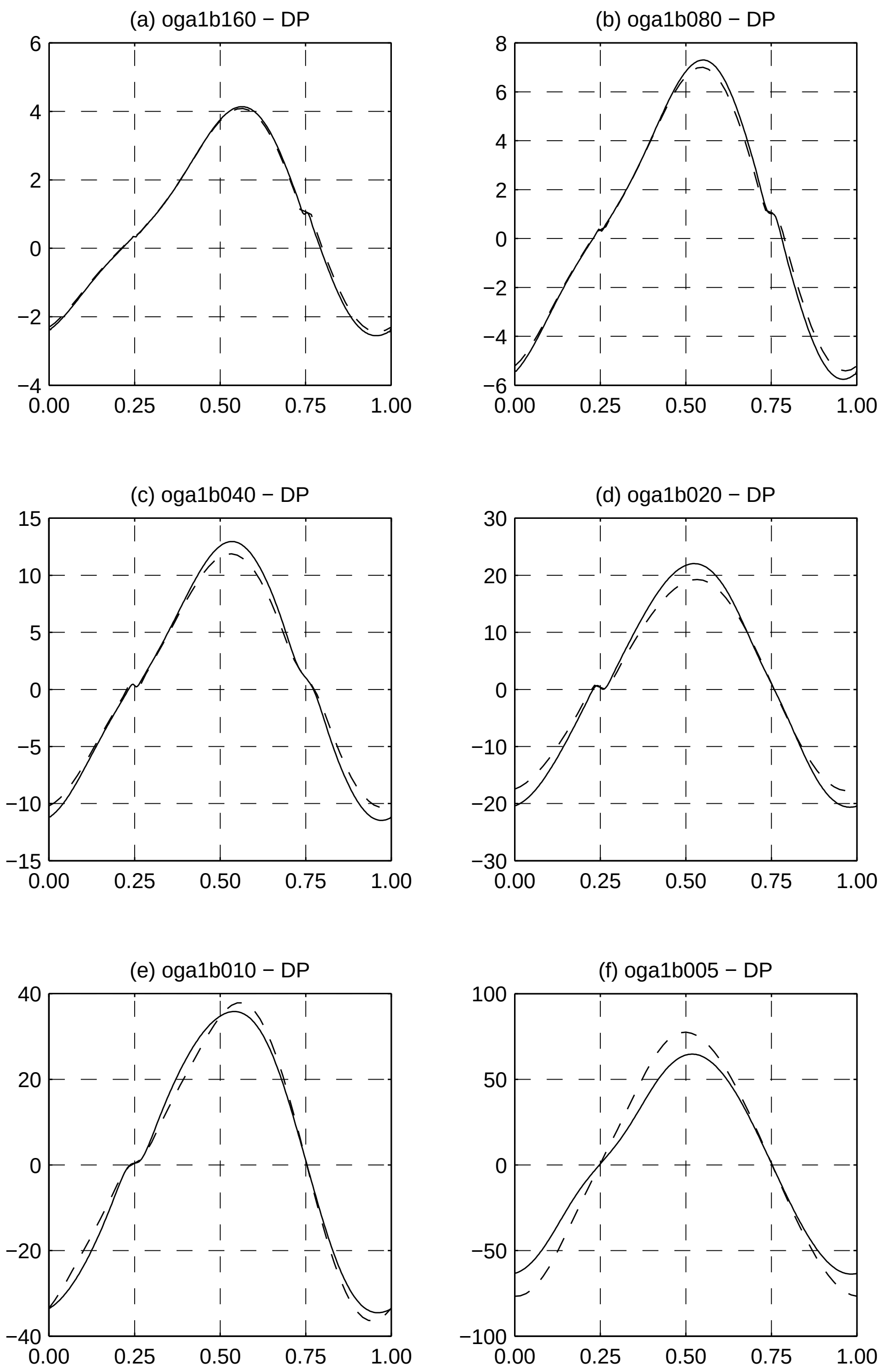

Fig. 12. Difference between the isotropic and hydrostatic pressure at the bed $\Delta p(x, z_s)$ for Experiment B (solid line) and $\Delta p(x, L/4, z_s)$ for Experiment A (dashed line) [kPa] as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

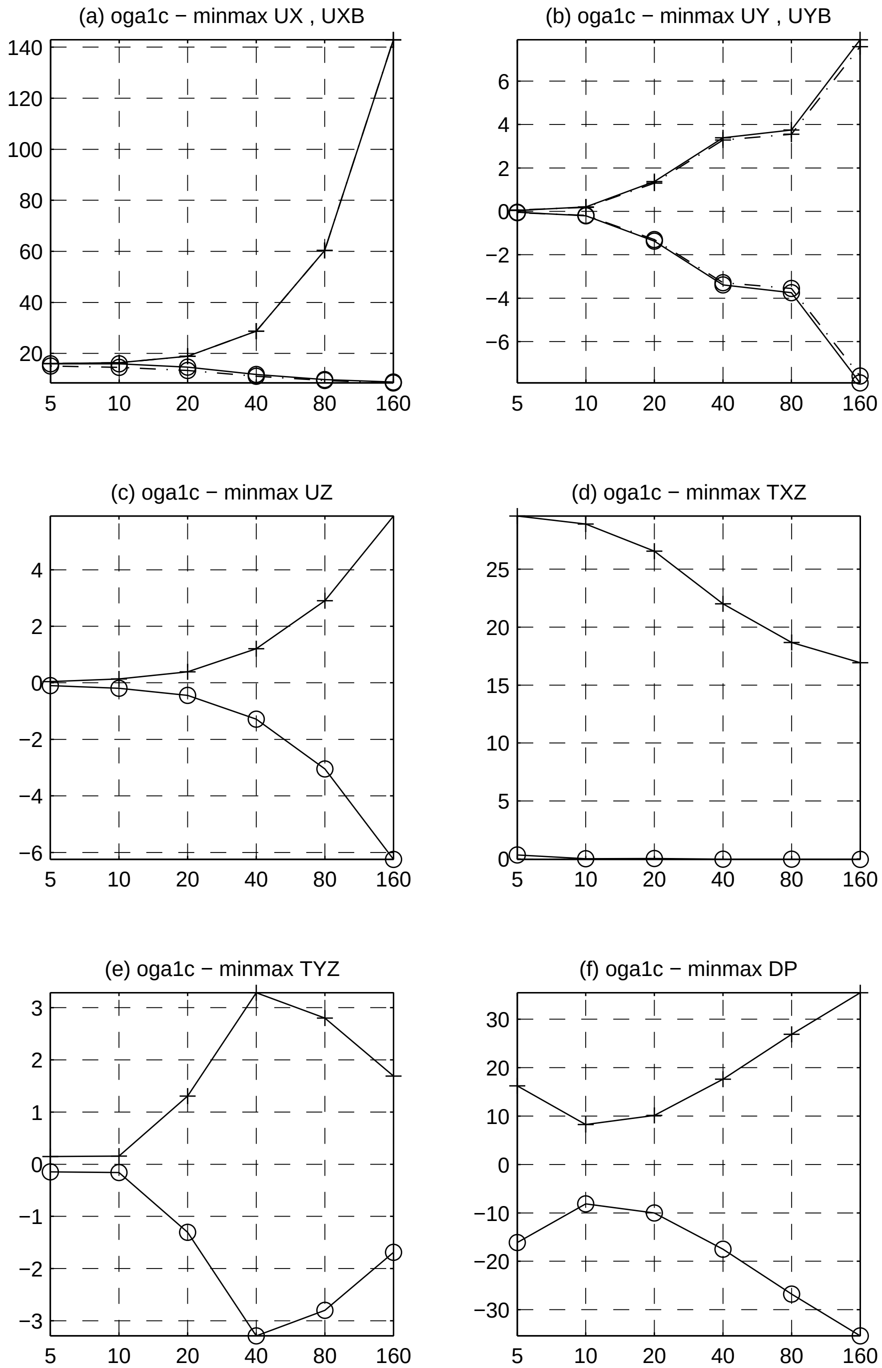

Fig. 13. Experiment C - Minimal and maximal values of the horizontal velocities **(a)** $u_x(z_s)$, $u_x(z_b)$ and **(b)** $u_y(z_s)$, $u_y(z_b)$ (with line at the surface and dashed line at the base), **(c)** the vertical surface velocity $u_z(z_s)$, the shear stresses **(d)** $\tau_{xz}(z_b)$ and **(e)** $\tau_{yz}(z_b)$ and **(f)** the difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ as a function of the domain length L (km). See Table 1 for the description of the different variables and the units.

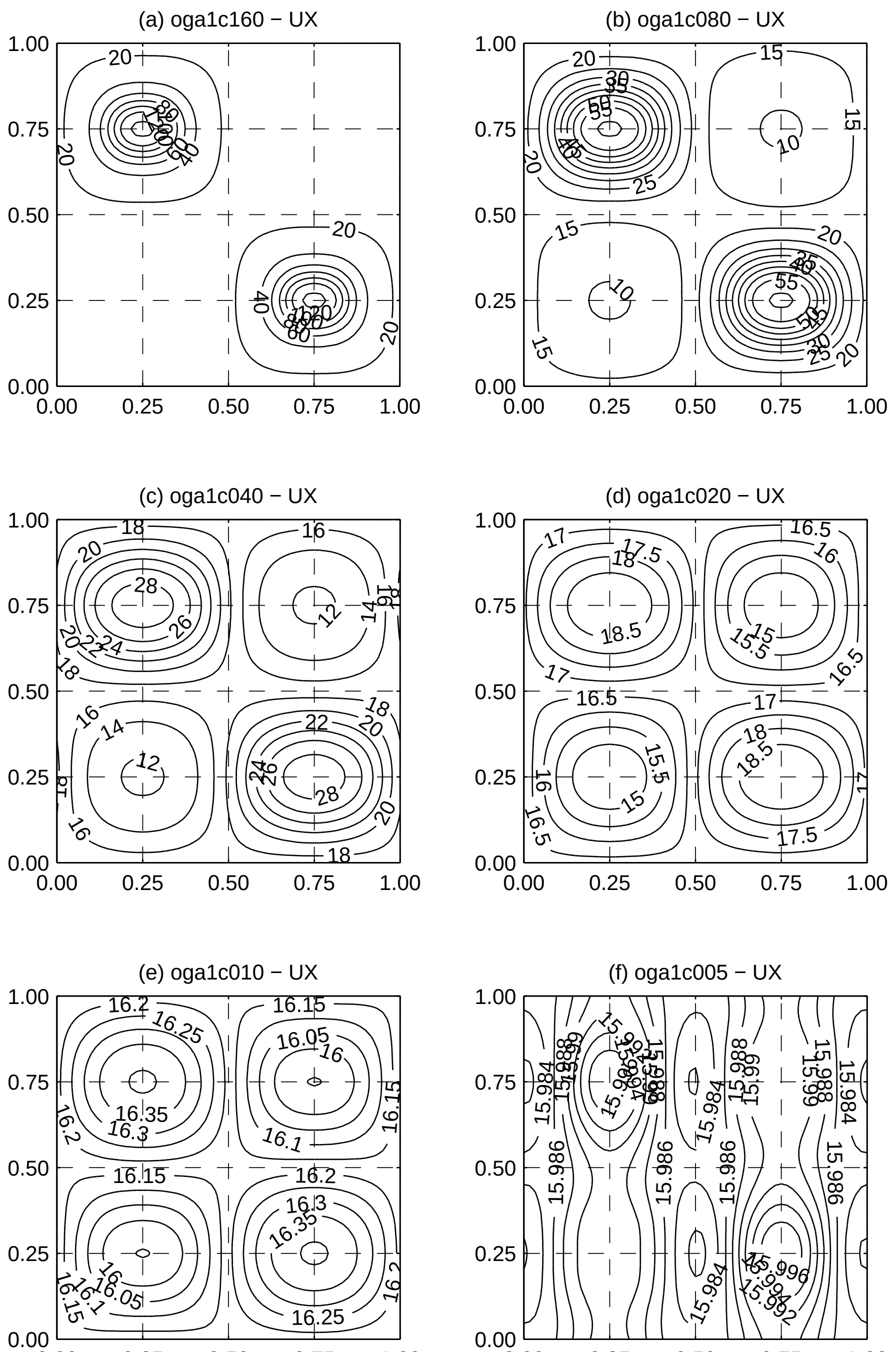

Fig. 14. Experiment C - Horizontal surface velocity $u_x(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

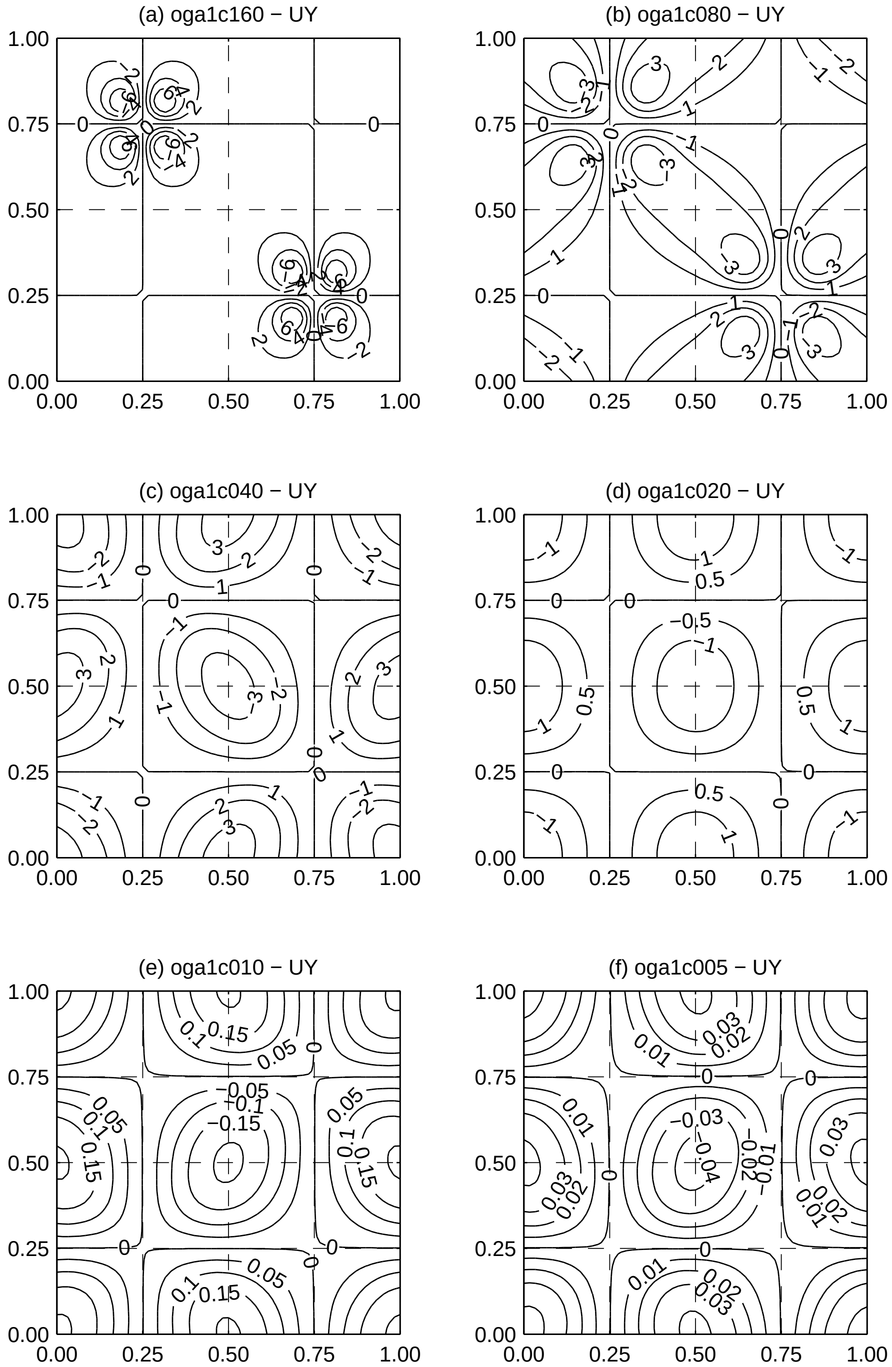

Fig. 15. Experiment C - Horizontal surface velocity $u_y(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160\ \mathrm{km}$, **(b)** $L = 80\ \mathrm{km}$, **(c)** $L = 40\ \mathrm{km}$, **(d)** $L = 20\ \mathrm{km}$, **(e)** $L = 10\ \mathrm{km}$ and **(f)** $L = 5\ \mathrm{km}$.

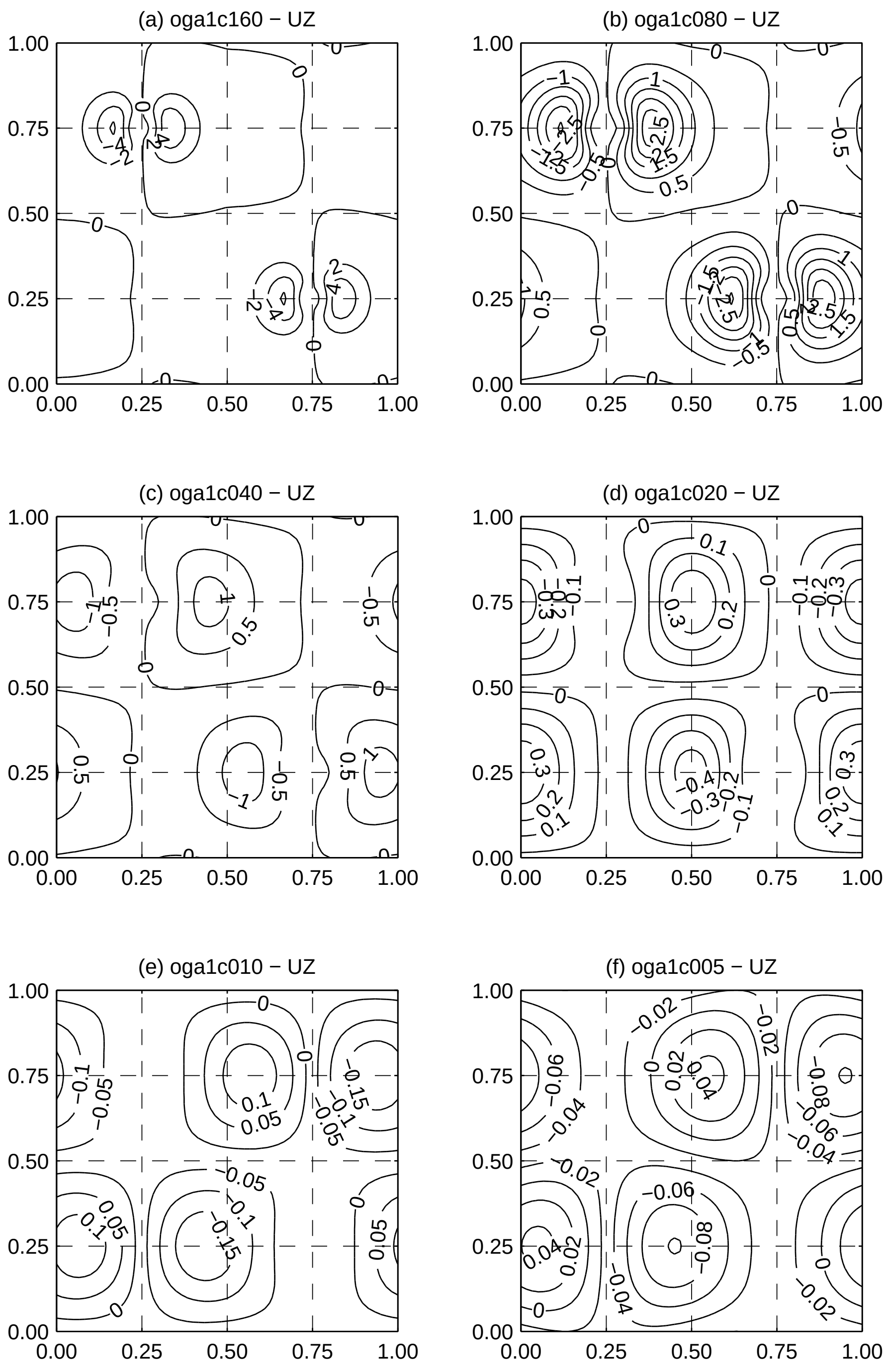

Fig. 16. Experiment C - Vertical surface velocity $u_z(z_s)$ [ma^{-1}] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

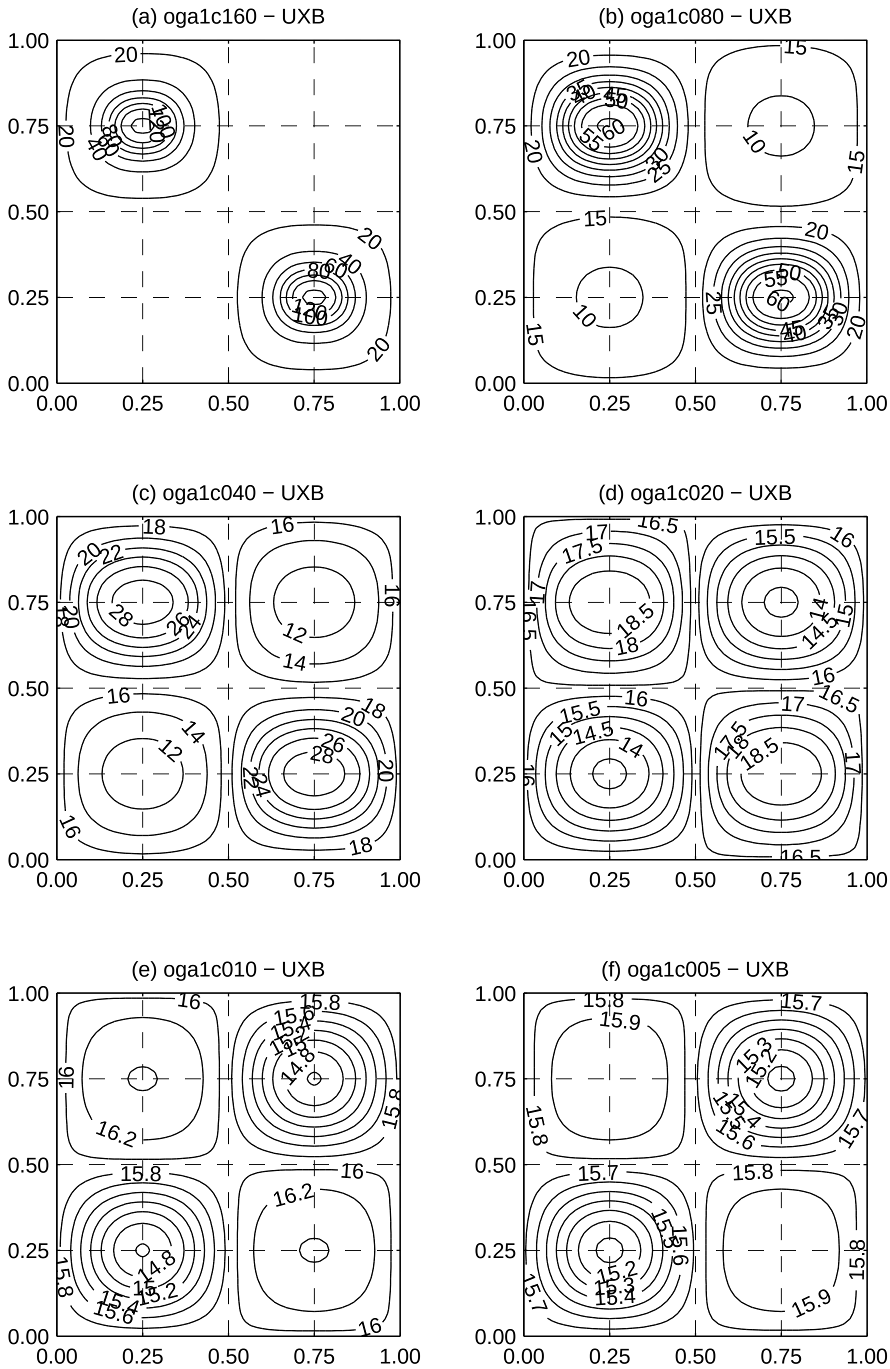

Fig. 17. Experiment C - Horizontal bed velocity $u_x(z_b)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

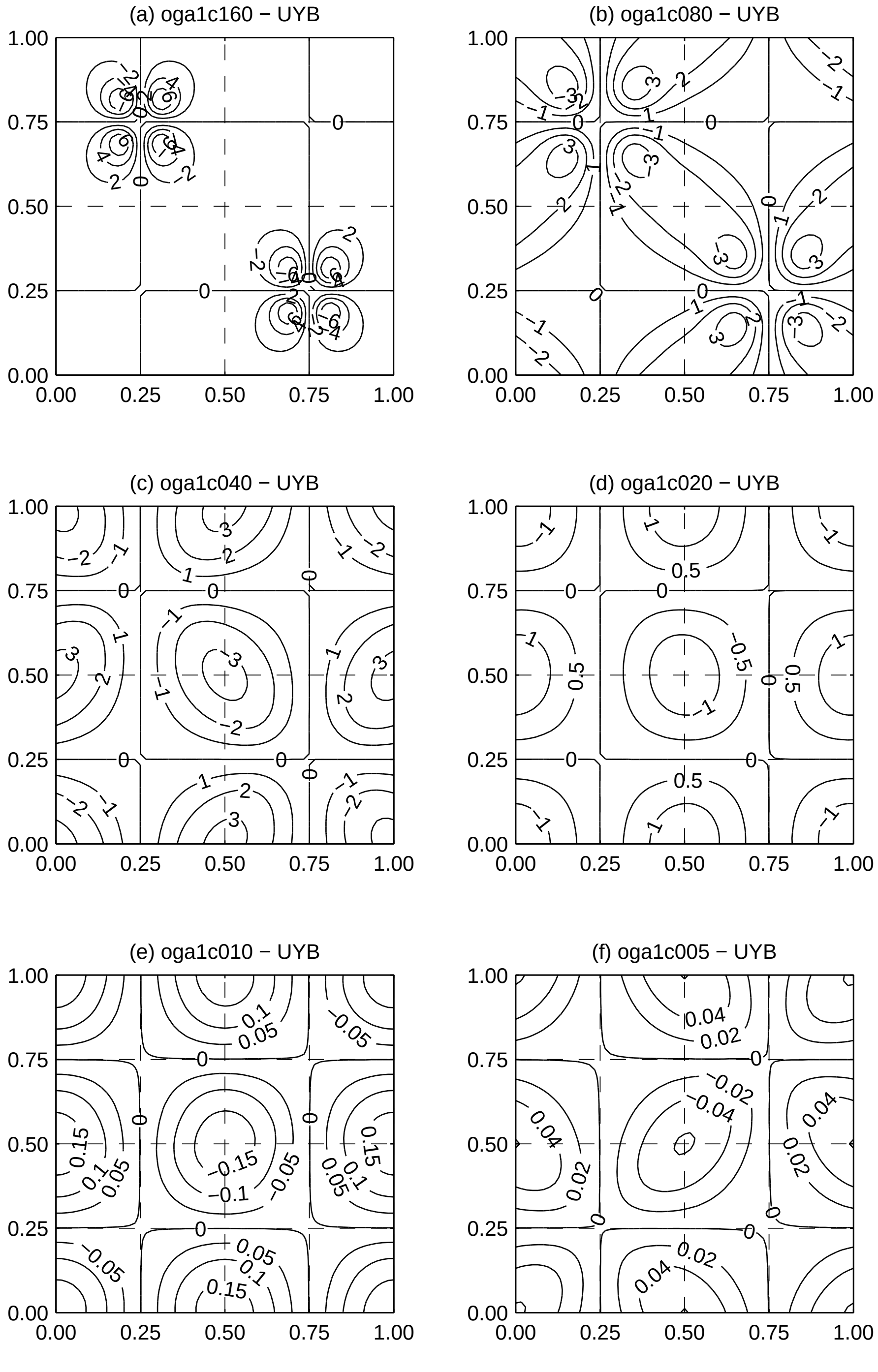

Fig. 18. Experiment C - Horizontal bed velocity $u_y(z_b)$ [ma^{-1}] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

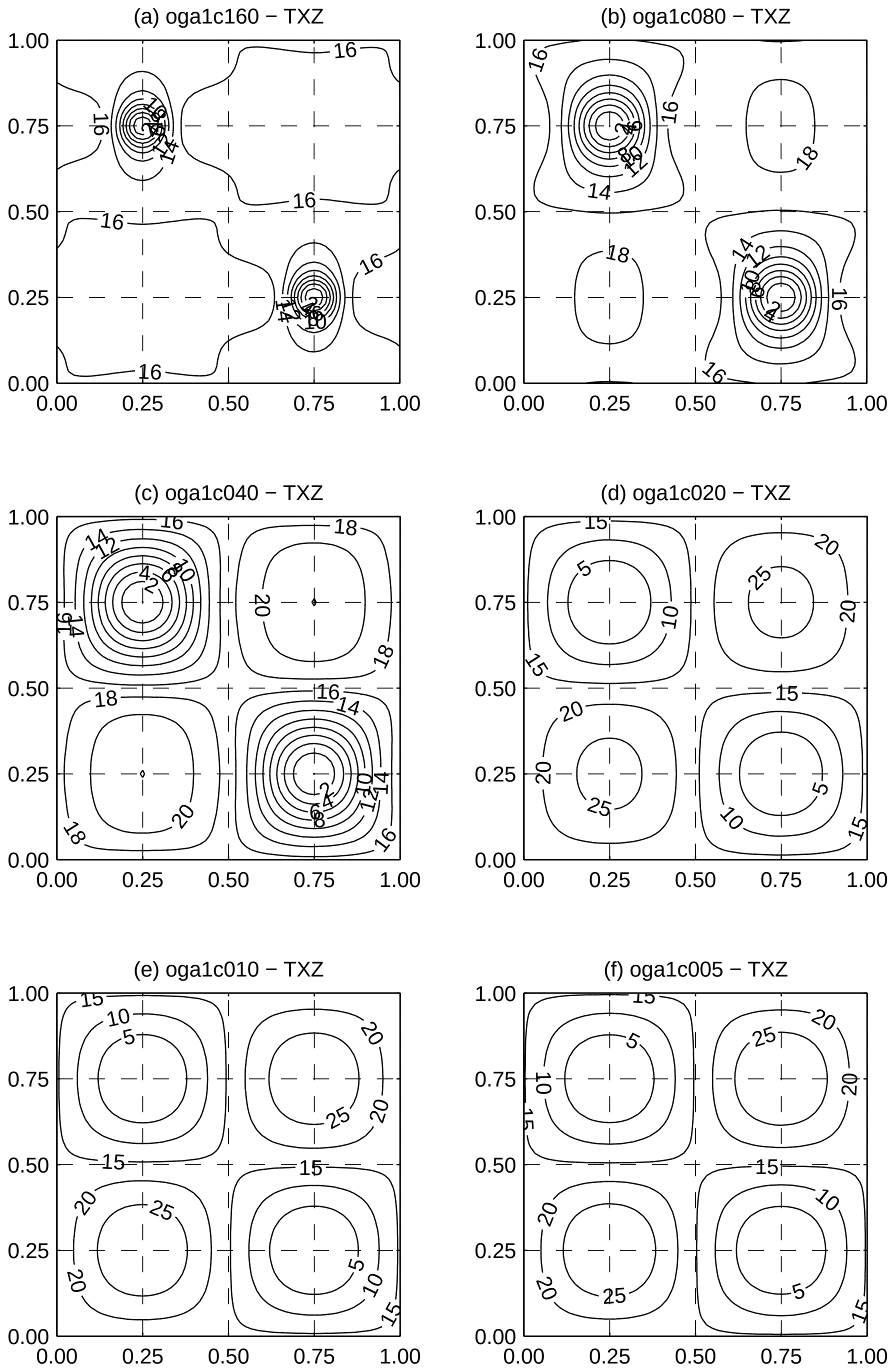

Fig. 19. Experiment C - Basal shear stress $\sigma_{xz}(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

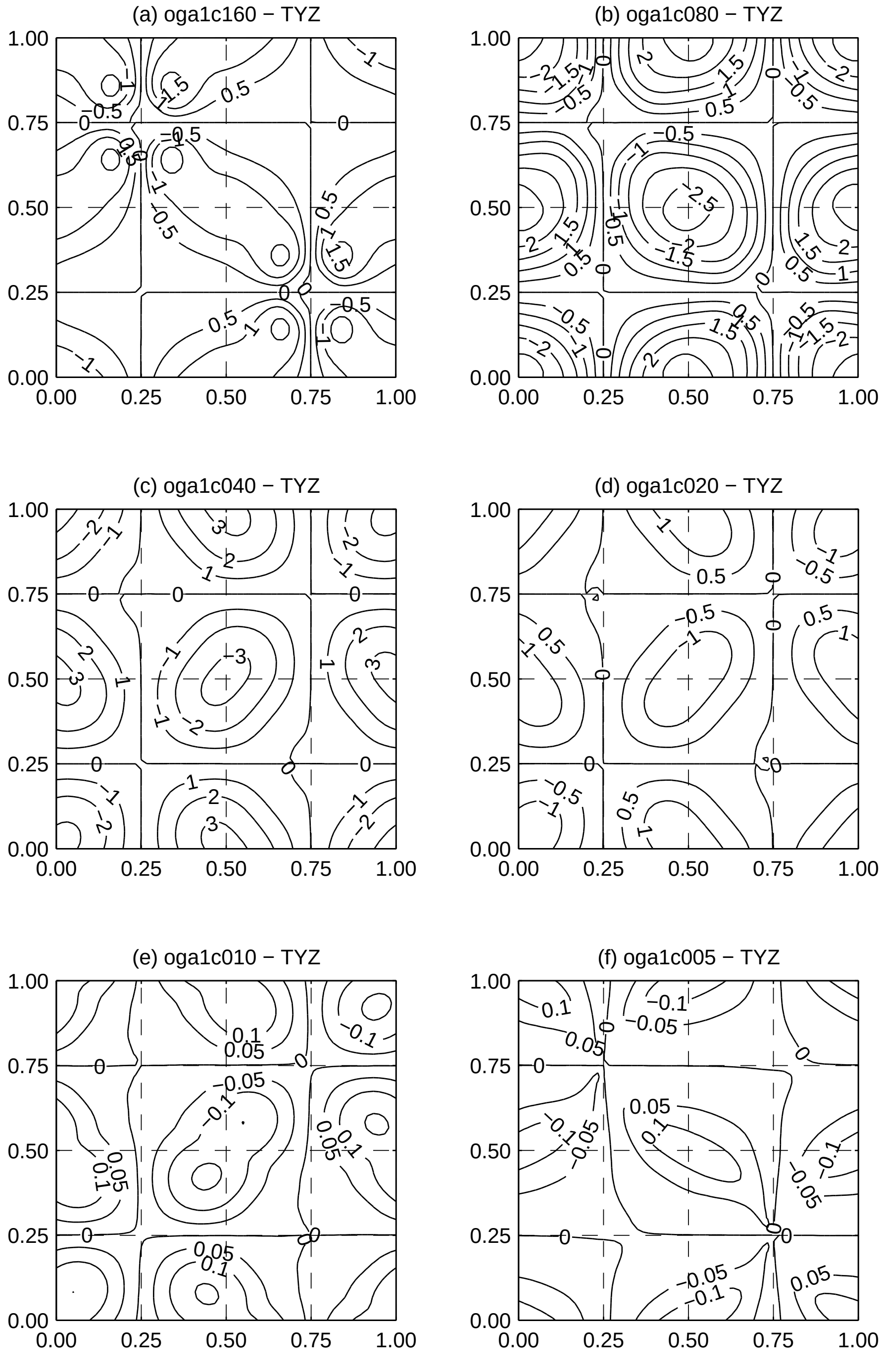

Fig. 20. Experiment C - Basal shear stress $\sigma_{yz}(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

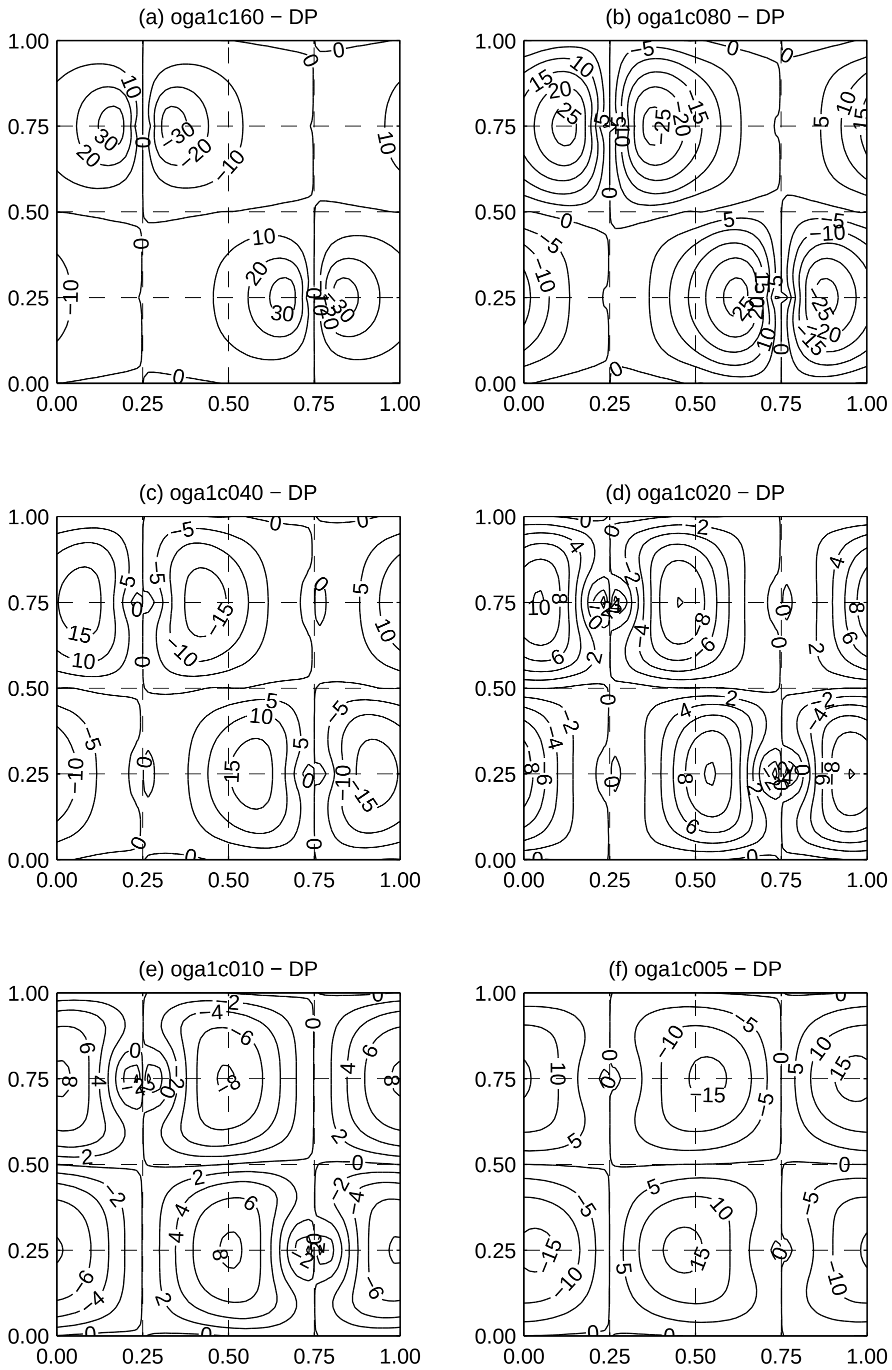

Fig. 21. Experiment C - Difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ [kPa] as a function of the horizontal coordinates $\hat{x}$ and $\hat{y}$ for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

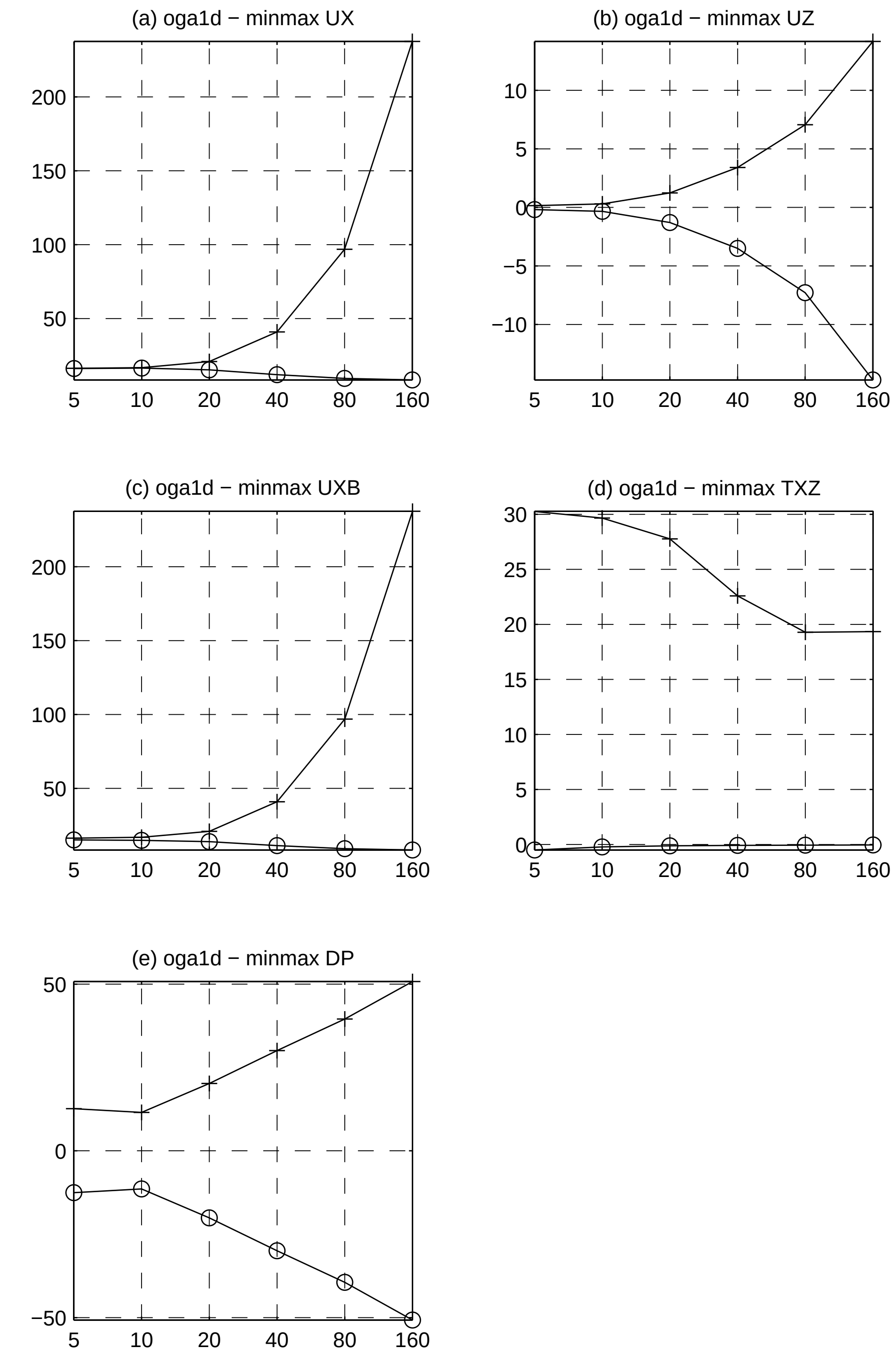

Fig. 22. Experiment D - Minimal and maximal values of **(a)** the horizontal surface velocity $u_x(z_s)$, **(b)** the vertical surface velocity $u_z(z_s)$, **(c)** the horizontal bottom velocity $u_x(z_b)$, **(d)** the basal shear stress $\tau_{xz}(z_b)$ and **(e)** the difference between the isotropic and hydrostatic pressure at the bed $\Delta p(z_b)$ as a function of the domain length L (km). See Table 1 for the description of the different variables and the units.

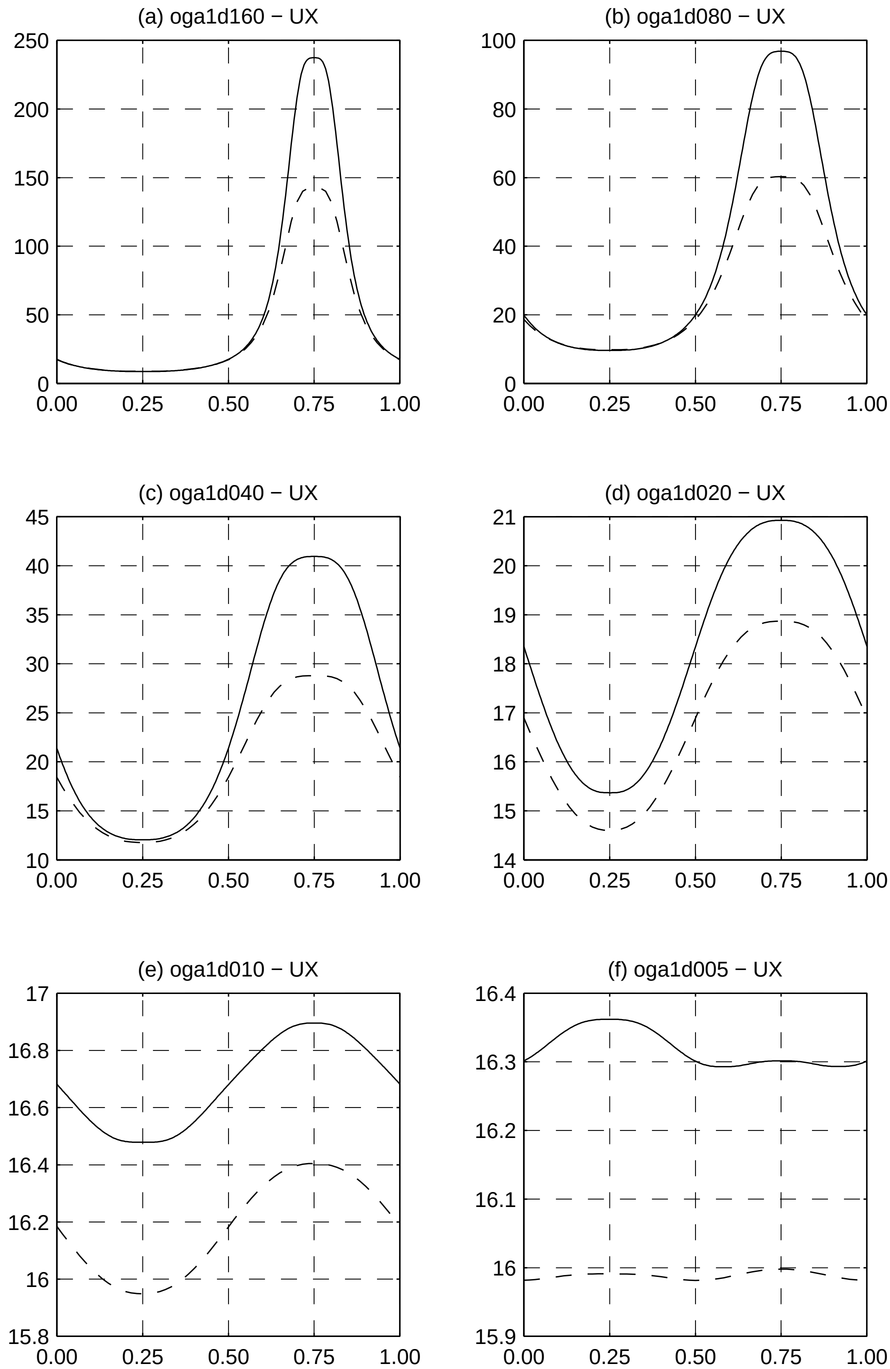

Fig. 23. Horizontal surface velocity $u_x(x, z_s)$ for Experiment D (solid line) and $u_x(x, L/4, z_s)$ for experiment C (dashed line) $[\mathrm{ma}^{-1}]$ as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

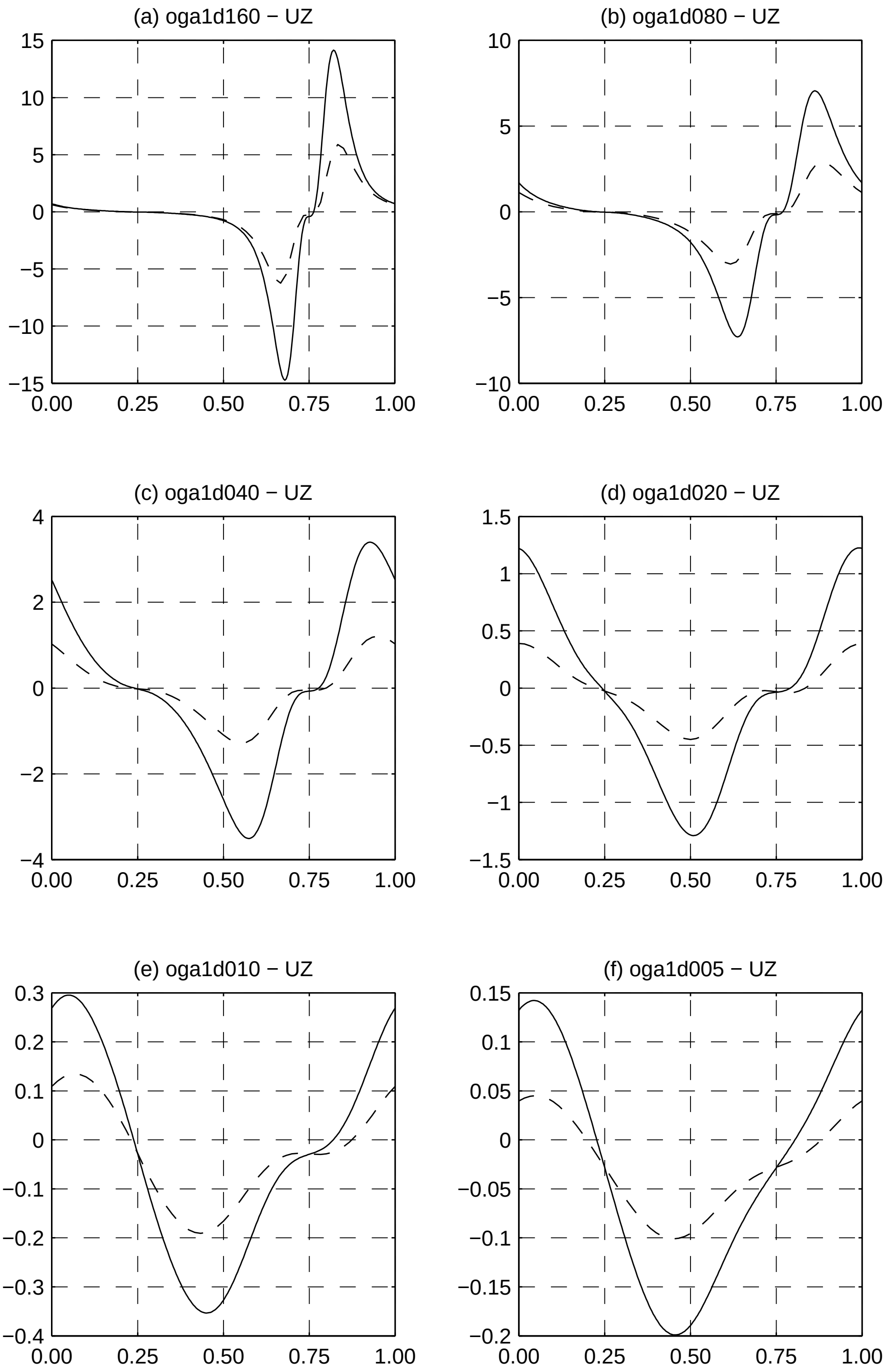

Fig. 24. Vertical surface velocity $u_z(x, z_s)$ for Experiment D (solid line) and $u_z(x, L/4, z_s)$ for experiment C (dashed line) $[\mathrm{ma}^{-1}]$ as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

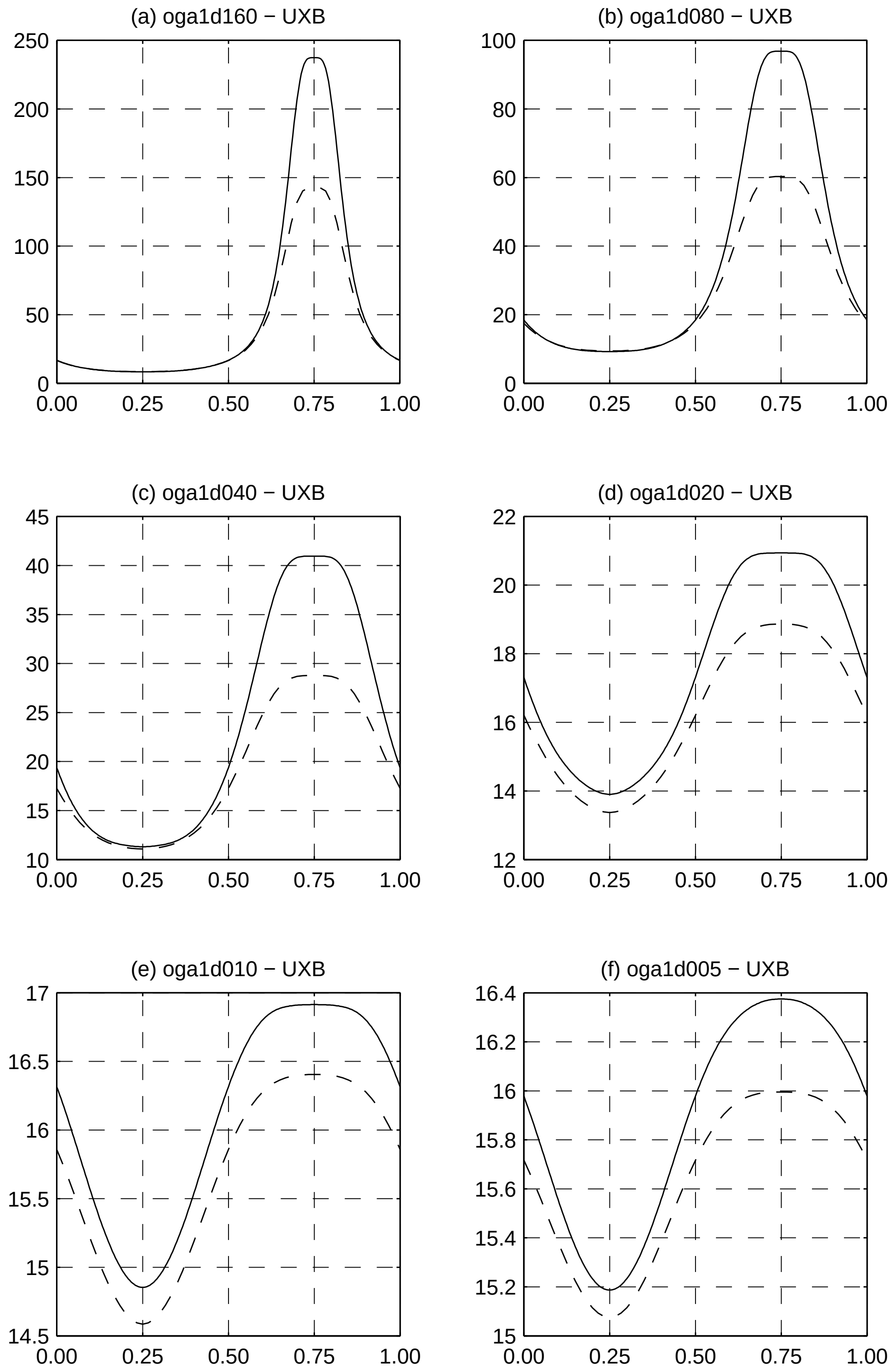

Fig. 25. Horizontal bottom velocity $u_x(x, z_b)$ for Experiment D (solid line) and $u_x(x, L/4, z_b)$ for experiment C (dashed line) $[\mathrm{ma}^{-1}]$ as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

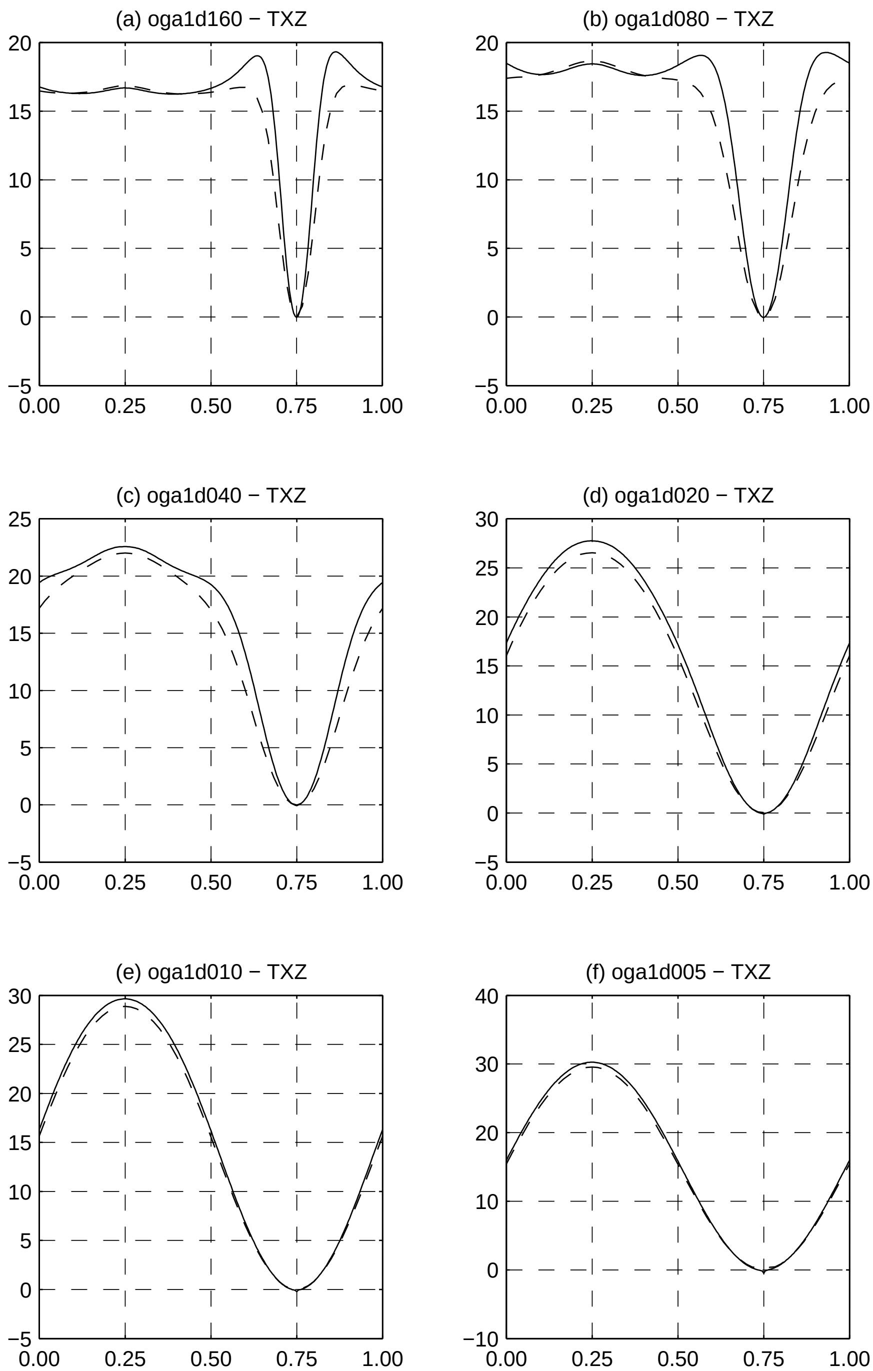

Fig. 26. Basal shear stress $\sigma_{xz}(x, z_b)$ for Experiment D (solid line) and $\sigma_{xz}(x, L/4, z_b)$ for experiment C (dashed line) [kPa] as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

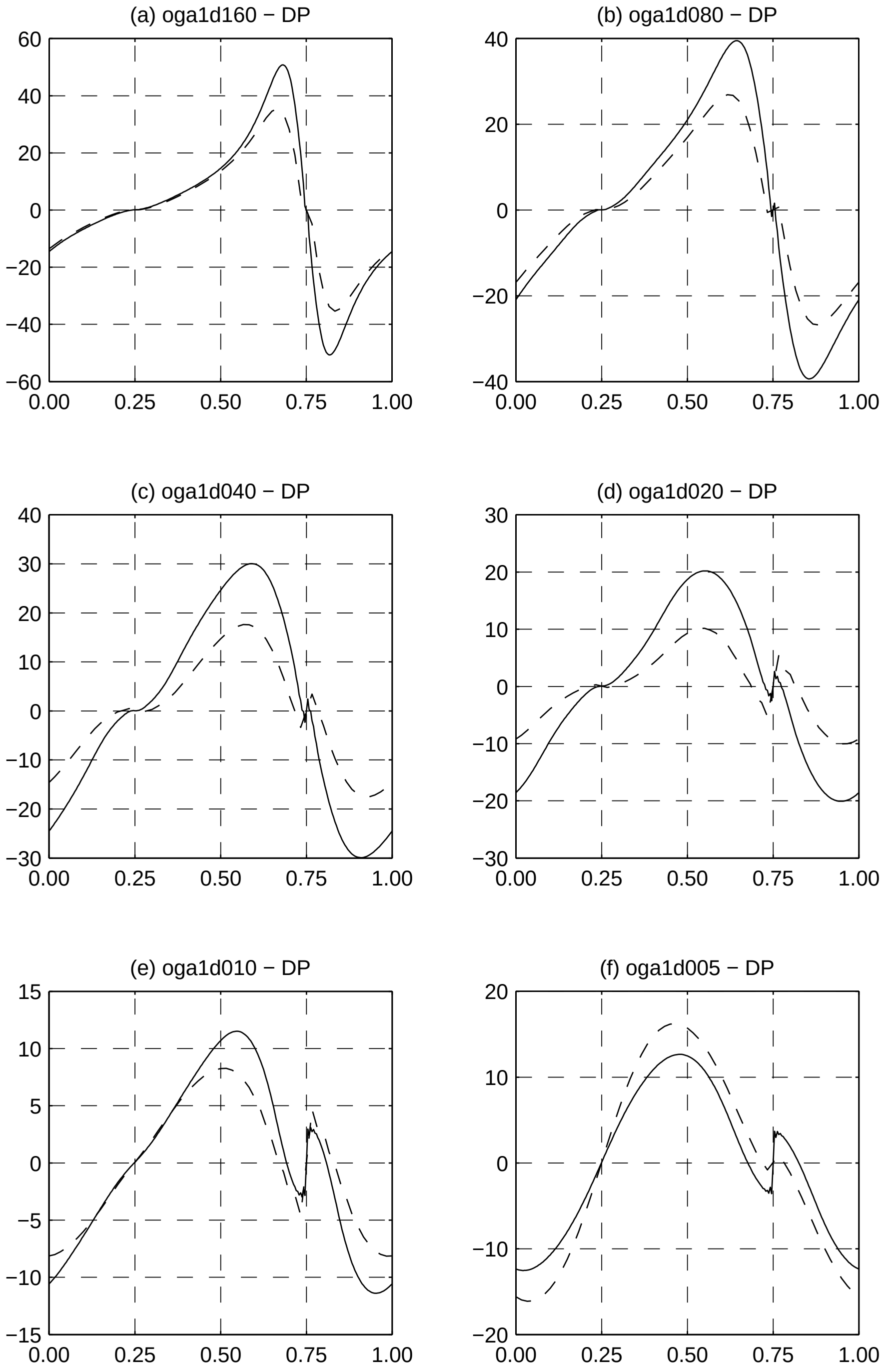

Fig. 27. Difference between the isotropic and hydrostatic pressure at the bed $\Delta p(x, z_b)$ for Experiment D (solid line) and $\Delta p(x, L/4, z_b)$ for experiment C (dashed line) [kPa] as a function of the $\hat{x}$ coordinate for domain lengths **(a)** $L = 160$ km, **(b)** $L = 80$ km, **(c)** $L = 40$ km, **(d)** $L = 20$ km, **(e)** $L = 10$ km and **(f)** $L = 5$ km.

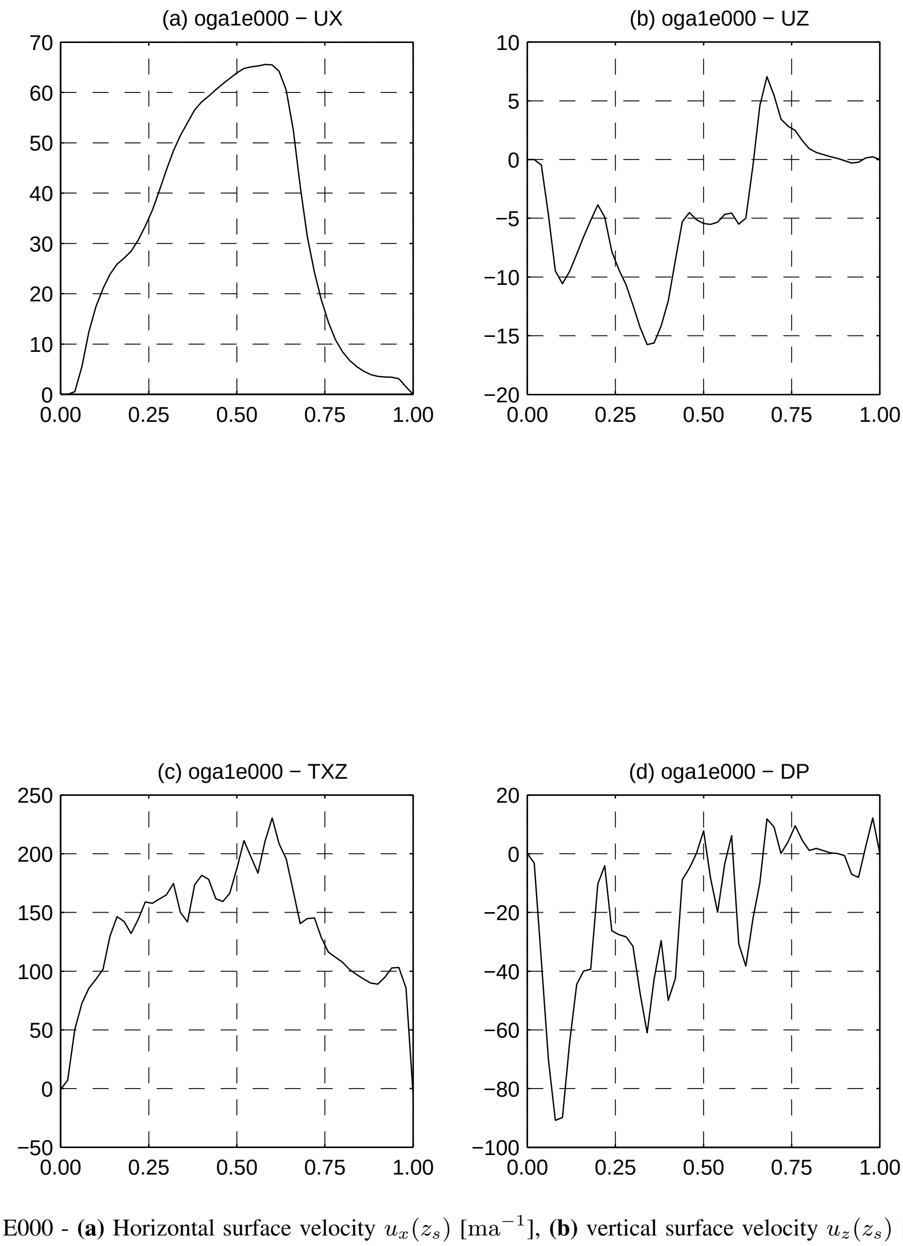

Fig. 28. Experiment E000 - **(a)** Horizontal surface velocity $u_x(z_s)$ $[\mathrm{ma}^{-1}]$, **(b)** vertical surface velocity $u_z(z_s)$ $[\mathrm{ma}^{-1}]$, **(c)** basal shear stress $\sigma_{xz}(z_b)$ $[\mathrm{kPa}]$ and **(d)** difference between the isotropic and hydrostatic pressure at the bed$\Delta p(z_b)$ $[\mathrm{kPa}]$ as a function of the horizontal coordinate $\hat{x}$.

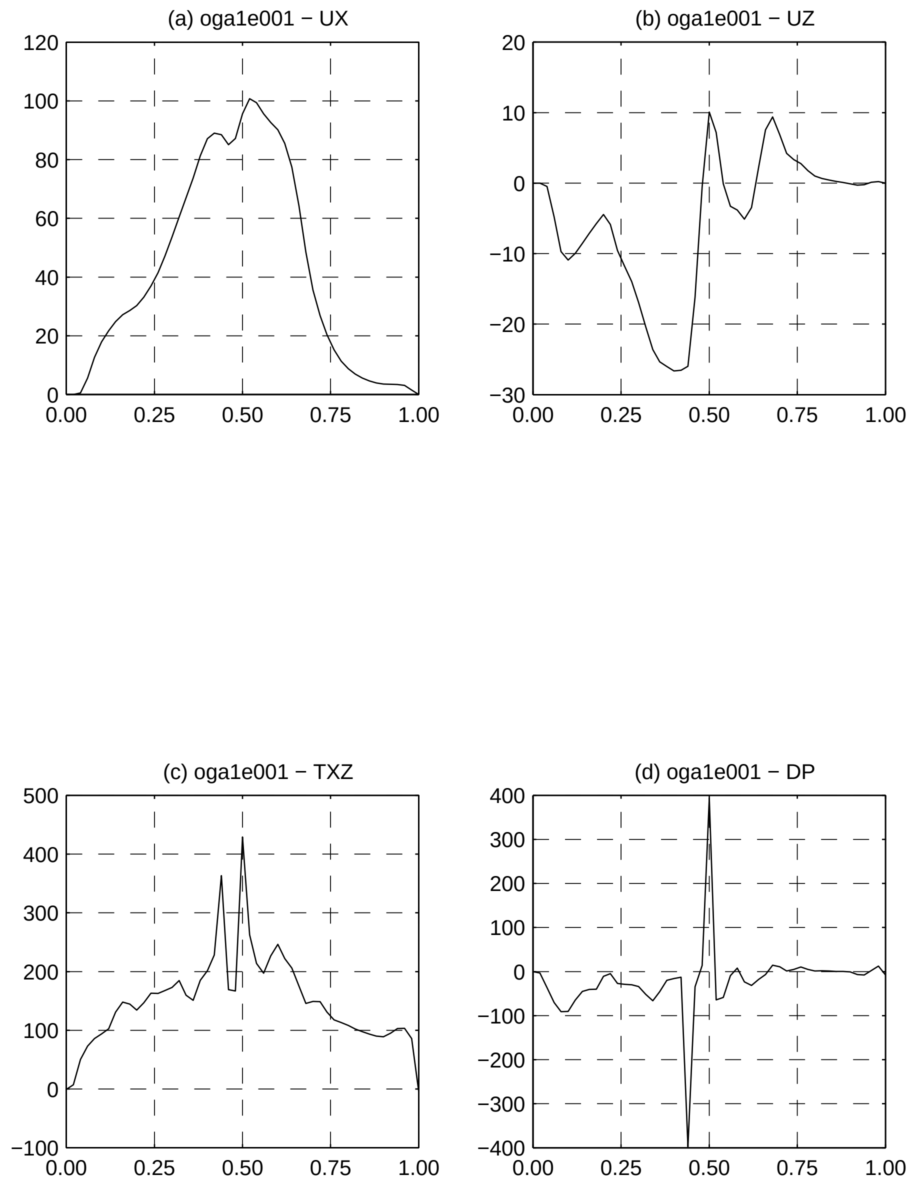

Fig. 29. Experiment E001 - **(a)** Horizontal surface velocity $u_x(z_s)$ $[\mathrm{ma}^{-1}]$, **(b)** vertical surface velocity $u_z(z_s)$ $[\mathrm{ma}^{-1}]$, **(c)** basal shear stress $\sigma_{xz}(z_b)$ $[\mathrm{kPa}]$ and **(d)** difference between the isotropic and hydrostatic pressure at the bed$\Delta p(z_b)$ $[\mathrm{kPa}]$ as a function of the horizontal coordinate $\hat{x}$.

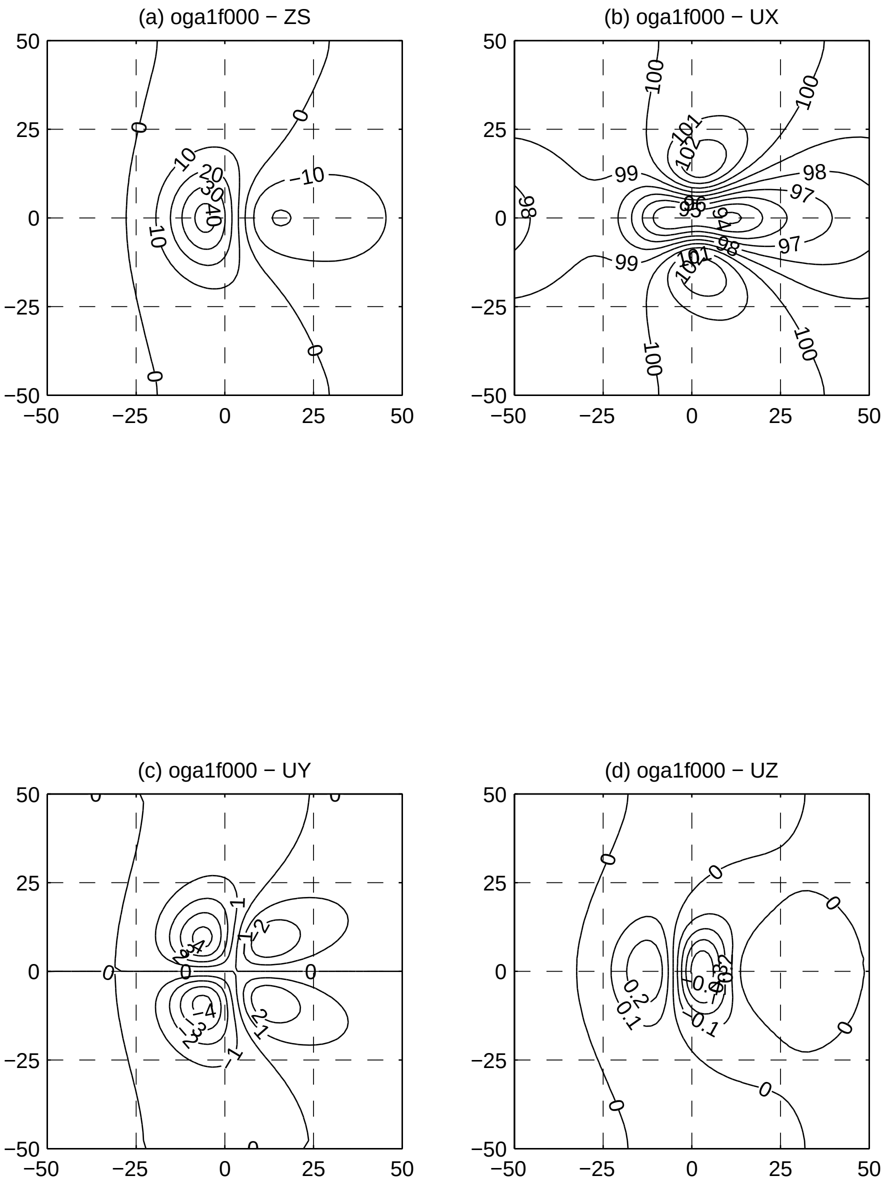

Fig. 30. Experiment F000 - **(a)** Altitude of the free surface z_s $[\mathrm{m}]$ and surface velocity components **(b)** $u_x(z_s)$, **(c)** $u_y(z_s)$ and **(d)** $u_z(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates x and y.

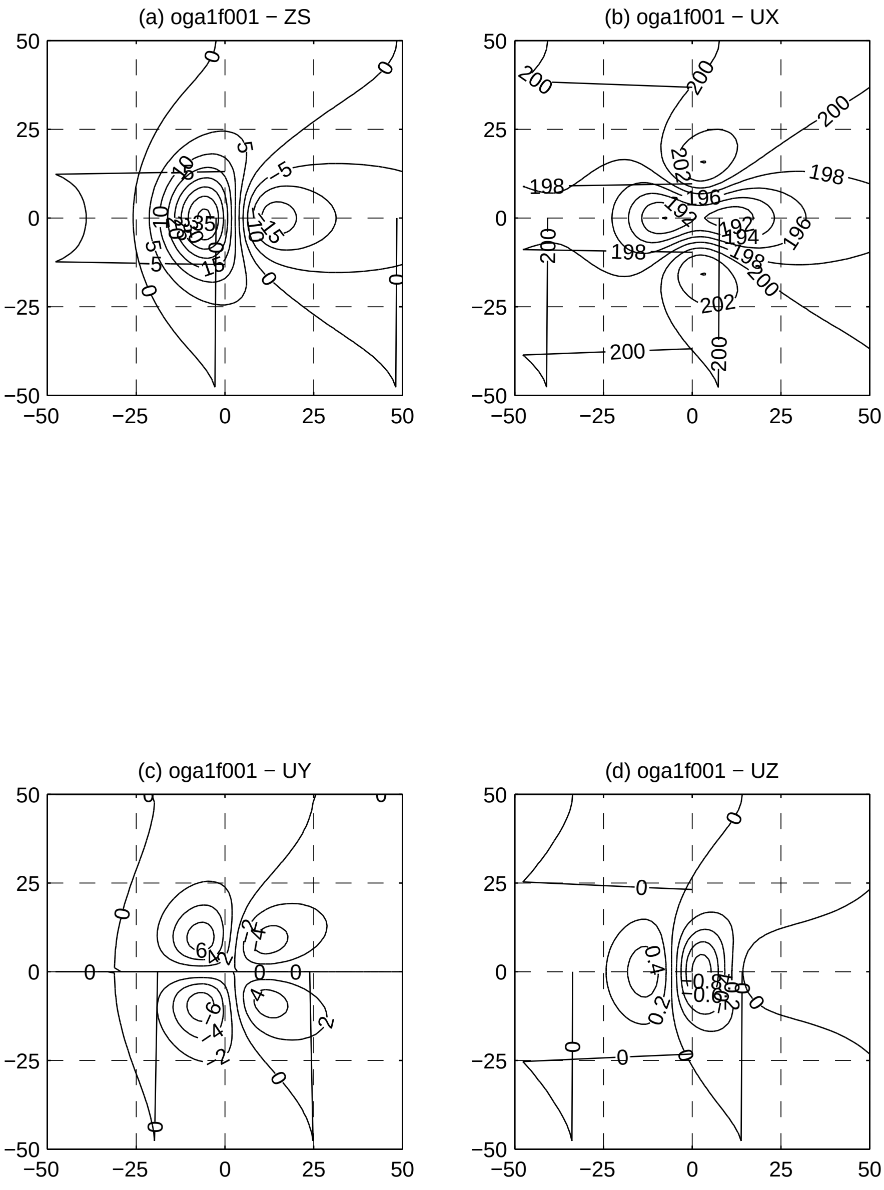

Fig. 31. Experiment F001 - **(a)** Altitude of the free surface z_s $[\mathrm{m}]$ and surface velocity components **(b)** $u_x(z_s)$, **(c)** $u_y(z_s)$ and **(d)** $u_z(z_s)$ $[\mathrm{ma}^{-1}]$ as a function of the horizontal coordinates x and y.