The Cryosphere
Discussions

Interactive comment on "Manufactured solutions and the numerical verification of isothermal, nonlinear, three-dimensional Stokes ice-sheet models" *by* W. Leng et al.
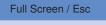
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Received and published: 14 September 2012

We found only two small differences between our paper and this article:

1. In solving equation (32), which is equation (59) in our paper, the authors fixed one mistake without coming to a different result. The final formulas, (37)-(39) in this article and (68)-(70) in our paper are identical. We are thankful for fixing this mistake.

2. In manufacturing a solution for time-dependent ice-flow, we both applied the above formulas (37)-(39) for the same Pattyn's benchmark problem. These for-

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mulas have some parameters that can be chosen a priori. We defined parameters $\gamma_1 = 1$ and $\lambda_1 = 1$, Leng et al. defined them as $\gamma_1 = 0$ and $\lambda_1 = 4$. Both definitions allow exact solutions and Leng's definition results in nicer formulas.

These parameters define the form of the x-horizontal velocity - (21) in this article and (54) in our work. By choosing $\gamma_1 = 1$ and $\lambda_1 = 1$, we assume that the x-horizontal velocity depends on both ice thickness (h) and ice depth (d), while Leng et al. by choosing $\gamma_1 = 0$ and $\lambda_1 = 4$ assume that it depends only on ice depth. You can choose another values for parameters γ_1 and λ_1 and will get another variation of the solution.

Interactive comment on The Cryosphere Discuss., 6, 2689, 2012.

C1565