HESSD

Interactive
comment

Interactive comment on "Impact of skin effect on single-well push-pull tests with the presence of regional groundwater flow" *by* Xu Li et al.

Xu Li et al.

wenz@cug.edu.cn

Received and published: 24 October 2018

Thank the reviewer very much for his/her careful check on the manusript. The point to point response can be found in the following. Please note that the referred page number and line number are referred to the marked version in the supplement files. The supplement files include: a marked version of the revised manuscript, a clean version of the revised manuscript, a supplementary material of the revised manuscript, and the response letter to all the referees' comments.

1) Figure 4 looks NOT an appropriate flow pattern that satisfies the boundary conditions (6) [line 158, page 8], where the streamlines should be orthogonal to the upper and lower boundaries. The boundaries that are assumed to be no flux DO NOT behave

this way. Please double check the model BC is set correctly Reply: We are sorry for not making this point clearly in the previous manuscript. Actually, the streamlines are orthogonal to the upper and lower boundaries in this model, Figure 4 only shows a flow pattern for a small area nearby the well, not for the entire domain, thus the streamlines there appear not orthogonal to the upper and lower boundaries. We have added "nearby the well" in the figure caption and also clarify this point in the revised manuscript. See p. 18 lines 356-358. 2) During the "rest phase" (t_inj<t<t_res), there wouldn't be the well performance, but there still exits the background groundwater flow which has the velocity v2>0, so the boundary condition (14) [line 193, page 10] was set inappropriately by ceasing the radial flux. It could be a good idea that setting no BC in the borehole at this phase. Reply: We agree with the reviewer on this point. We have revised it accordingly as the reviewer suggested. See p. 13, lines 251-257. Some minor typos found: 1) Line 152, page 8, "r is the radial distance [L]" is repeatedly stated, previously its definition already given in line 147. Reply: Implemented. See p. 10, line 192. 2) Line 158, notation "n" was not explained in context, it should be the norm vector of the boundary. Reply: The notation "n" has been explained in manuscript. See p. 15, lines 281-282. 3) Line 206, page 11, the surface-integral over the borehole should be expressed more specifically, showing the integral variable (dr) under the integral sign. Reply: Actually, this intergral variable should be $d\theta$ instead of dr. The range of θ is $[0, 2\pi]$, meaning that this equation is integrated over the perimeter of the borehole. After a serious consideration, we think it is more appropriate to keep it as it was. See p. 17, line 323

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-279/hess-2018-279-AC1-supplement.zip

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-279, 2018.