Drinking Water
Engineering and Science
Discussions

Interactive comment on "A pipe network simulation model with dynamic transition between free surface and pressurized flow" *by J. Fernández-Pato and P. García-Navarro*

Anonymous Referee #1

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* Does the paper address relevant scientific questions within the scope of DWES?

No, the paper addresses partially filled, non-pressurized pipes with complete filling and pressurization as an exceptional condition, and as such this subject is marginally relevant for drinking water distribution systems. Shown examples are not representative of DWDSs in terms of dimensions and physical behavior. No attempt is made to illustrate the relevance for DWDSs.

* Does the paper present novel concepts, ideas, tools, or data?

Coupling of free-surface and pressurized flow has been shown before, e.g. in

C. Bourdarias, S. Gerbi (2007) A finite volume scheme for a model coupling free surface and pressurised flows in pipes. Journal of Computational and Applied Mathematics, Volume 209, Issue 1, 1 December 2007, Pages 109–131

The novelty of the approach presented in this paper is not clear to me. This may be a presentation issue rather than a material issue, however.

No attempt is made to apply these equations to problems relevant for drinking water distribution, which might introduce some novelty.

* Are substantial conclusions reached?

Some conclusions are drawn on conceptual and numerical aspects of the numerical approach. No conclusions relevant to DWDSs are drawn, apart from mentioning the possibility of adapting the method to more realistic (and more relevant) systems.

* Are the scientific methods and assumptions valid and clearly outlined?

Some more references for the sets of equations are necessary for non-specialists.

* Are the results sufficient to support the interpretations and conclusions?

The results are illustrations of the working of the numerical methodology rather than thorough tests.

* Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)?

Probably, yes.

* Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

No, see above and below.

* Does the title clearly reflect the contents of the paper?

yes

* Does the abstract provide a concise and complete summary?

yes

* Is the overall presentation well structured and clear?

yes

* Is the language fluent and precise?

reasonably so

* Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?

Units are not specified.

* Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?

Some of the figures need modification, see below.

* Are the number and quality of references appropriate?

Some more references for the mathematical-physical model are necessary.

* Is the amount and quality of supplementary material appropriate?

n.a.

General comments

I recommend making indicating more clearly the novel part of the work and addressing its relevance for drinking water distribution.

Specific comments

- The paper would benefit from a language review by a native speaker.

- chapter 2: please provide units for all parameters

- chapter 2: please provide references for the less common (terms in) equations, e.g. pressure forces due to channel width changes

- section 5.3: Many of the presented results are meaningless for people who are not familiar with the Wiggert test. Either reference results should be included or the frames without measurements should be removed.

- section 6: It is impossible for the reader to determine whether these are good results or not. Presented like this, they are a mere illustration rather than a validation.

Technical corrections (non-exhaustive)

p.29 line 1: [trans]forms

p. 29 line 4: conservatives, results

p.29 line 8: from two main points of view

p.39 line 3: use \cite[]

p. 32 line 8: immediate

p.32 equation 14: term theta is not defined

Figure 1: symbol sigma is not used in text, symbol b in figure is different from symbol b in equation 5.

Figure 7: Upstream

Figure 8: Indicate also here what the four frames represent, and why there are only measurements in frame b.

Figure 9: y-axis label is in Spanish!

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