Reply to: Interactive comment on GO2OGS: a versatile workflow to integrate complex geological information with fault data into numerical simulation models
Anonymous Referee #3

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Abstract

We would like to thank the reviewer for the thorough review of our manuscript. We tried to address all comments and listed the changes as a summary below.
All edits are also signified in the updated manuscript with colored text. Unless stated otherwise, we will refer to the page and line numbers of the edited document in the way "p #, l #" (p for page, l for line).
Furthermore, we added an edited manuscript without showing the changes.

1   Specific comments

1.1   In the title, the authors use a word versatile to describe his strategy. However, I do not know whether it is suitable for other situations without using GOCAD and VTU, and whether the mesh creation method is suitable for other numerical models? Maybe the authors can remove this.

We think that the fundamental approach we present could be useful to other workflows that similarly try to achieve an integration of data from one software product to another one using any data format. In this sense, the workflow is not limited to GOCAD or Petrel or any other specific software, which has also been acknowledge by the other two reviewers.

In this context, it seems important to underline that the outcome of steps ② to ④ can be used independently from our choice of the numerical model (OpenGeoSys). This is due to the selection of the output format: we are aware of the fact that there is a multitude of different modeling software existing and

that many modellers tend to choose those numerical toolboxes which they are familiar with. By using the open-source framework VTK, we assure that this model choice is not limited by the output format of our methodology.

Although, we do not provide a workflow that will work with *any* combination of software or data formats, we think that we offer a relatively close approach to an universally applicable one.

Therefore, we would like to keep the word "versatile" in the title of the manuscript.

We tried to underline this fact even more by revising section 4.1.

1.2 In the first section, the authors discussed the importance of integration of data and models for collaborative work and comprehensive research. It is indeed a hot topic currently, and there are much research has been done in this fields, especially data conversion between models, model integration and sharing though web, et al., the author may reference more papers about model integration and talked about some essential difficulties when build a versatile workflow.

Thank you for suggesting to add more citations to support the relevance of the topic. We provided more citations of recent works in the problem description ([1, 4, 2, 3], see section 1.1).

1.3 The authors use the abbreviation of VTU, VTK in the abstract and first paragraph, but give their full names in the later parts. I think the full names should be given when these words appeared for the first time.

Thank you for pointing this out. We added the full names of the abbreviations VTU and VTK at the first occurrence in the full text (compare p 5, l 5).

1.4 In section 2, I suggest to put the explanation of EQ.1 also in 2.1 background because it seems undertake the same task as 2.1.1 and 2.1.2.

Thank you for the comment; as suggested, we moved the respective paragraphs into section 2.1.

1.5 According to the workflow introduced in 1.4, maybe 2.2 Converting gocad SGrid data to an open data format can be changed to 2.2 Converting GOCAD SGrid data to an open data format and its quality evaluate.

Due to the change in the structure, we think that the former title of this section is appropriate.

1.6 Please explain VTU+ in figure 2.

We added an explanation on p 14, l 16.

1.7 Maybe g in Figure 3 should be G.

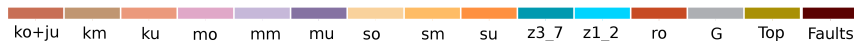This is correct, thank you for this keen observation. We corrected the mistake (compare 1).

ko+ju km ku mo mm mu so sm su z3_7 z1_2 ro G Top Faults

Figure 1: Legend for geological units of "Setup B"; for abbreviations see Table **??**.

References

[1] N J Hardebol and G Bertotti. DigiFract: A software and data model implementation for flexible acquisition and processing of fracture data from outcrops. *Computers and Geosciences*, 54:326–336, 2013.

[2] S. Ragettli, F. Pellicciotti, W.W. Immerzeel, E.S. Miles, L. Petersen, M. Heynen, J.M. Shea, D. Stumm, S. Joshi, and a. Shrestha. Unraveling the hydrology of a Himalayan catchment through integration of high resolution in situ data and remote sensing with an advanced simulation model. *Advances in Water Resources*, 78:94–111, 2015.

[3] Chaopeng Shen, Jie Niu, and Kuai Fang. Quantifying the effects of data integration algorithms on the outcomes of a subsurfaceland surface processes model. *Environmental Modelling & Software*, 59:146–161, 2014.

[4] Qiang Wu, Hua Xu, and Xukai Zou. An effective method for 3D geological modeling with multi-source data integration. *Computers & Geosciences*, 31(1):35–43, 2005.