Answers to referee #1

General Comments

The paper by O. Conrad et al. presents general structure and capabilities of the opensource GIS, SAGA. This software has become an important contribution to a health and ever growing free and open-source software ecosystem for geographic information analysis. A paper summarizing SAGA's structure and features has therefore been overdue and is likely to be cited very often.

Specific Comments

R: "While the paper's description of software history, structure and philosophy and the general overview of its capabilities is very welcome, I feel that the review of SAGA applications in section 3 could be substantially shortened. To showcase the diversity of applications in which SAGA has been used, perhaps one or two (page-filling) tables and a brief textual summary would prove more useful."

Answer: we will follow your suggestion and add a table that gives an overview to the references categorized by the addressed research fields; this coincides also with the suggestion of referee #2 to provide a *'visualization of the fields'*, which currently make use of SAGA. We also agree that section 3 looks a bit lengthy, especially when compared to the following sections. However, we refrain from shortening its content substantially. The software SAGA evolved within scientific projects and as also highlighted by referee #2 the development was largely driven by science. Therefore, we think the science behind is an important aspect of SAGA and the various studies better reflect the wide scope and applicability than just a presentation of the functionality.

Other aspects, however, that would add to the relevance of this paper, are currently missing. In particular, a general comparison of SAGA's capabilities and features to other commercial as well as open-source GIS would give the reader a better idea as to what to expect from this software, and it would help to situate SAGA within the opensource GIS ecosystem. This could again partly be presented in tabular form, and/or it could involve references in the text to comparable (or not so comparable) features in well-known software, e.g. SAGA tool chains seem to be similar to ArcGIS ModelBuilder, and Python geoprocessing in ArcGIS is comparable to Python or R scripting with SAGA (is it?). These comparisons would (likely) reveal sets of GIS functions that are currently not available in SAGA tools (e.g. address geocoding or vehicle routing?), inspiring the reader to consider contributing to SAGA development.

we will add a subsection to give a comparison with other GIS software and also to outline interrelations between SAGA and the *'GIS ecosystem'*. Referee #2 made a similar suggestion. The focus will be kept on open source GIS, due to the fact that - apart from ArcGIS - we have neither access nor much experience with commercial GIS.

Overall, I believe that this publication will be a valuable contribution to documenting the current state of free and open-source geographic information analysis, but I recommend major modifications based on the above comments.

Additional detailed comments and editorial changes:

P2272L8 "modular organized" - omit "organized"

will be done

P2272L10 "easily approachable" - change to "user-friendly"

will be done

P2272L11 "scripting and low level programming languages like R and Python" - neither of these is "low level", and instead of "scripting language", "interpreted language" would be more accurate; omit "scripting and low level"

will be done

P2272L21 Provide some context on free and open-source software for the geosciences / geography / geographic data analysis before focusing on SAGA.

we will add one or two opening sentences to give a context

P2272L5 change "in behalf" to "on behalf"

will be done

Much of the current Introduction should better be placed in a separate section giving a brief history of SAGA; I noticed some overlap with the current section 2

yes, we will have a look at this

First paragraph of the current introduction is too long. In general throughout the manuscript, paragraphs tend to be rather long - consider splitting them into shorter paragraphs

will be done

P2273L21 "SAGA got a growing global user community" - rephrase: "SAGA's global user community has been growing"

according to referee #2, we will replace *'got'* with *'built-up'*

P2273L28 "raised" - change to "rose"

will be done

P2274L7 "by a review of" - change to "by reviewing"

will be done

P2274 SAGA as FOSS - Free software and open-source software are overlapping concepts with different philosophical motivations. My feeling is that SAGA is "free" rather than (just) "open-source". Use proper academic reference when introducing the concepts of free and open-source software.

yes, we agree; academic reference will be added

P2274L24 "base" - change to "basis"

will be done

P2275L2 "discussion" - change to "comments"

will be done

P2275L4 "widespread and effective" seems redundant

we will remove *'and effective'*

P2276 and elsewhere: change "meta data" to "metadata", "data base" to "database"

will be done

P2277L24 Is there any academic reference that could be used when referring to GDAL?

yes, we will refer to Bivand (2014) GeoComputation and Open-Source Software (In: Abrahart & See, GeoComputation)

P2279L11 "Summarizing" - change to "In summary,"

will be done

P2279 Section 2.4 Perhaps a small table would be suitable for summarizing which software uses SAGA modules or API and how

will be done

Section 3 - Much of this could be summarized in one or two (large, page-filling) table in order to make the text more readable and the breadth of applications more accessible to the reader. E.g. the long paragraph that makes up most of section 3.1.4 is very difficult to digest by the reader, and most other subsections of section 3 follow a similar style of briefly mentioning numerous studies that used SAGA

will be done, also see our above answer in the *specific comments* section