Response to Reviewers' Comments on
JOSS-2970 : PolSAR tools: A QGIS plugin for generating SAR descriptors

This manuscript was submitted to The Journal of Open Source Software (JOSS-2970). As per the reviewers' suggestions, the plugin documentation, functionalities and interface are revised and updated.

The authors are indebted to the reviewer for constructive review comments, which has been instrumental in improving the technical quality of the plugin.

In the following we transcribe the comments in *gray italics*, and our responses in blue in a **response** section.

Associate Editor Remarks:

@Narayana-Rao is it clear to you that the review is iterative? I am asking because you wrote a formal response to reviewer in a PDF, and while it's fine, I believe it would be better if you just answered here in plain text and discussed with the reviewers.

> **Response:**
> The authors want to thank the editor for the suggestions.
>
> Yes, we agree that it is easy for both the reviewers and authors to answer through the comments section. For future conversations, we will follow your recommendation, apology for the inconvenience.

(Point 1) *For the name, as I said, this is up to you, but as @HenrikJanPersson pointed out, it would be a better name and furthermore I reckon that since you're still in beta it's still time to change.*

> **Response:**
> After discussion we have considered @HenrikJanPersson suggestion to rename the tool as "PolSAR tools". Now the plugin is available as PolSAR tools. Thanks for your concern about the naming convention of the plugin.

(Point 2) *The comments of @liberostelios about the fact that the plugin is not cross-platform should definitively be addressed, and as for the GUI, I would also encourage you to use the "standard" QGIS one (it will also make is easier to upgrade the code in the future!).*

Let us now which timetime you have in mind to address those issues.

> **Response:**
> Yes, we have now addressed the problem of cross-platform compatibility.
>
> Regarding converting the plugin into a processing algorithm, it is true that a processing algorithm of QGIS enhances the flexibility of the tool in many ways (e.g. Automated scripts). However, the main aim of this tool is to provide the SAR community with the latest developments in polarimetric descriptors. Kindly note that the plugin is only a part of my PhD research work, where we provide recent advancements from our research group. Our group will convert the plugin to processing algorithms in future releases at a later stage. Besides, we are developing several other advanced SAR descriptors, which we will a part of this tool in future releases.

Reviewer 1

Thank you for the updates and for constructive feedback on my comments. Several things have been clarified and I think the changes have improved the overall impression greatly. I still have a few important comments.

SAR tools or any other more descriptive name: I agree with the authors that PolSAR often covers quad-pol data. Yet, I disagree with the authors that PolSAR would be limited to this type. In my experience, Polarimetric SAR intends all types of SAR where the polarization matters and more than a single combination is considered (e.g., HH, VV, or HV). In particular, PolSAR covers the target decomposition the authors are well aware of and also describe in the paper and address with the plugin, therefore it would be a much better fit. The name "SAR tools" would let the user assume to also get access to basic SAR operations, e.g., multilooking and basic filtering operations, which currently is not the case. I think SAR tools is simply too generic for this very particular set of operations you provide. Assuming you stick with SARtools, I think the background in the paper must ensure to not only referring to free products powered by ESA. Be ware of other softwares too (not limited to PolSAR but SAR in general), like DORIS, ISCE, GMTSAR, ROI·PAC and more.

> **Response:**
> Thanks for your concern about the naming convention of the plugin. We have now modified the name from 'SAR tools' to 'PolSAR tools' as per the suggestion.

(Point 1) *Paper: I would suggest to change "... all the three available ..." to only "... the three ...", since there are non-linear polarimetric acquisition modes as well (e.g. circular), which you do not cover.*

> **Response:**
> Thank you for your insightful suggestion. We have updated the manuscript according to the suggestion.

(Point 2) *Detail:*

process bar not updating when computing an index.

"The progress will get updated for the currently running process (Eg. Computing RVI from Full-pol data), however, if the dataset is small (like the sample data set), you may not notice the update because the whole progress bar will be filled and emptied in less than a second."

If it computes this so fast that I cannot notice, why not leaving it at 100% when finished? I see no point of resetting it to 0% before a new Process has been activated.

> **Response:**
> The authors thank the reviewer for the keen observation and suggestions. We have updated the progress bar status according to your suggestions.

Reviewer 2

The paper is well written and quite concise. As a non-expert in the SAR processing field I can't state much about this aspect, although as a GIS user and developer I wonder to which extend there is an overlap between this tool and GRASS (whose processing toolkit can be used from inside QGIS). Do you think it would be useful to provide a simple statement about how GRASS can deal with SAR and how your plugin might relate to this (a sentence or two might suffice)?

The plugin is easy to install and seems to be working for the most part. However, here are some comments about it:

> We certainly agree that GRASS processing algorithms are well integrated with QGIS. However, according to GRASS's documentation page, the availability of SAR data processing algorithms in GRASS is limited. Specifically, the available algorithms are more concentrated on standard image processing routines rather than polarimetric data processing. For example, it possible to process simple backscatter intensity images in GRASS (such as applying a boxcar speckle filter). However, processing polarimetric SAR data in the form of the C3/T3/C2/T2 complex matrices is currently unavailable. Many advanced polarimetric processing algorithms available in popular SAR processing tools like PolSARpro and SNAP are not available in GRASS GIS. Moreover, the algorithms implemented in the PolSAR tools plugin are presently unavailable in other popular SAR data processing software like SNAP and PolSARpro.

(Point 1) *I ran the plugin against the sample data on Linux and I came across an exception: AttributeError: module 'os' has no attribute 'startfile'. Please, beware that the os Python package might have differences between operating systems and since QGIS is expected to work well on Windows, macOS and Linux you might want to tackle this differently (see here).*

> **Response:**
> The authors would like to thank the reviewer for raising this issue. We admit that we had a similar issue with one of the community users on Linux. However, we have fixed the OS compatibility issue. You may kindly check the closed issue of the repository here.

(Point 2) *I find the user interface a bit overwhelming. There is too much information and functionality all in one form. Is this something necessary? For instance, can't the different data types be individual options, instead of just tabs in the same window?*

> **Response:**
> The authors are thankful for the suggestion on the UI structure. However, the tab-widget layout provides all the functionalities of the plugin in a common user interface. Because different data types: full-, compact- and dual-pol share a similar processing flow with different input variables. Therefore, it may confuse the user if we use separate windows for different data types. Further, it may be difficult for the user to find a specific function if we use different UIs for each data type. Nevertheless, we may categorize the UIs in future releases as we are developing many other SAR descriptors, which we will include in future releases. Hence, depending on the number of functionalities and complexity, we may switch to a categorized UI in future releases.

(Point 3) *The QGIS community has been strongly suggesting to move away from plugins with their own UI and towards extending the processing toolkit instead (see a nice talk about this). In addition to my previous point, I noticed that your UI has many similarities to the interface that custom processing algorithms provide and I think it would require minimal effort to convert your current code into processing algorithms. I think*

that this would take a lot of workload away from you (you won't have to design and maintain your own GUI) and it would make it easier for users to use the plugin both through the interface and in an automated fashion. There, I suggest that you consider converting this plugin to a processing algorithm instead (at least in the future).

Response:
The authors want to thank the reviewer for this suggestion. We completely agree with the reviewer's recommendation. As pointed out by the reviewer, a processing script will be more flexible (e.g., Automated processing chains) in a GIS environment than a standalone plugin. However, this tool aims to provide the SAR community with the recent advancements in polarimetric descriptors in one place. Kindly note that the plugin is only a part of my PhD work, where we provide recent advances from our research group. Our group will convert the plugin to processing algorithms in future releases at a later stage. Besides, we are developing several other advanced SAR descriptors, which we will a part of this tool in future releases.