# SAOCOM-1 Products
Opening images in QGIS

The following tutorial shows how to read SAOCOM images in the free QGIS[1] software. Please note that depending on the version of QGIS and the operating system you have installed, you may notice differences from what is stated in this document; however, the guidelines shown are still valid.

The following shows the structure of folders of the SAOCOM product zip file, how to unzip a SAOCOM image, how to load it and edit its properties in QGIS, and how to stack the image bands.

1. Download the .xemt and .zip files from the ftp site listed in the email sent to you under notice of available product.

   ☐ The .xemt file refers to the metadata of the product, including acquisition date, acquisition mode, polarization and image location among others.
   ☐ The .zip file contains the product data, including a quicklook, image quality data, and image bands.

2. Unzip the .zip file and you will find the following folder structure

   ☐ Config - Contains configuration files of the processor used to obtain the product.
   ☐ Data - Contains the image bands and their corresponding metadata.
   ☐ Images - Contains the quicklook of the image and a .kml file for Google Earth.
   ☐ Quality - Contains image quality data.

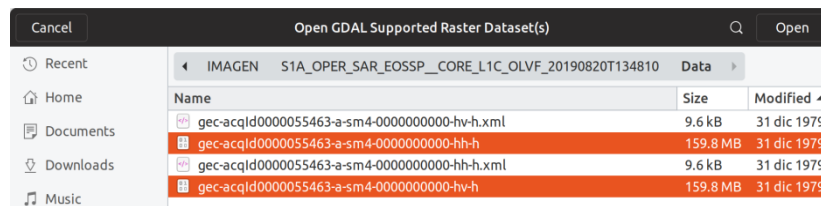3. The image files are in GeoTIFF format. To open them in QGIS click on the menu

   Layer > Add layer > Add raster layer

   Then click the [...] button to the right of the Raster Dataset(s) field.

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[1] https://www.qgis.org/en/site/
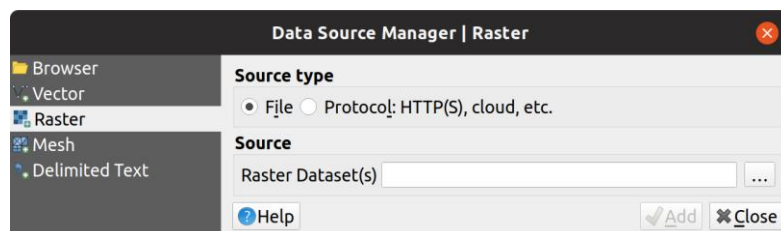
Select the files without extension (in this example the HH and HV bands), and then click on Open. Click Add to add the bands of the image in the Layers box.

4. To display the images correctly you must define the NO DATA digital value. To do this, right-click on the layer corresponding to one of the bands and select Properties. In Transparency set 0 in the "Additional no data value" field.
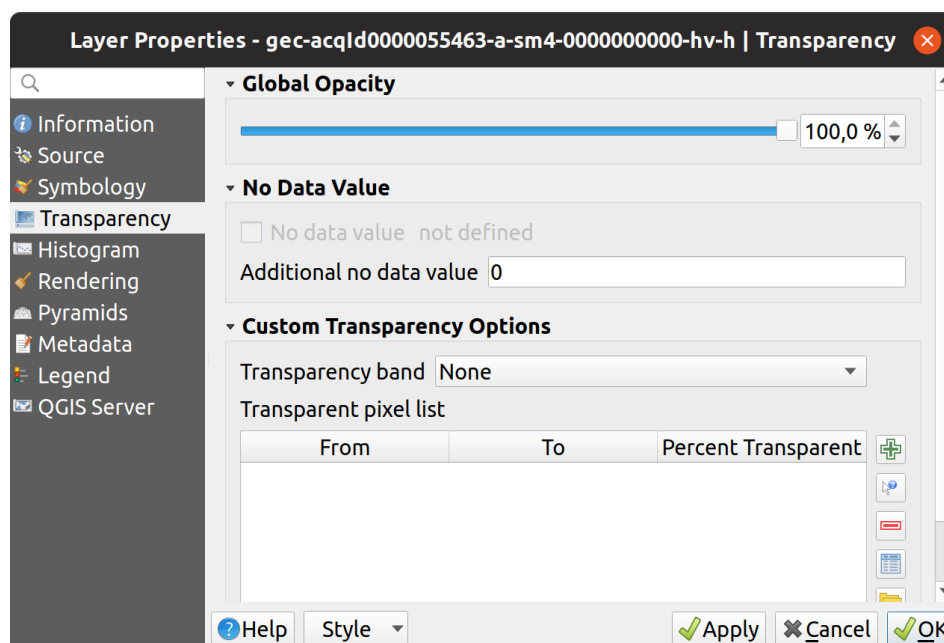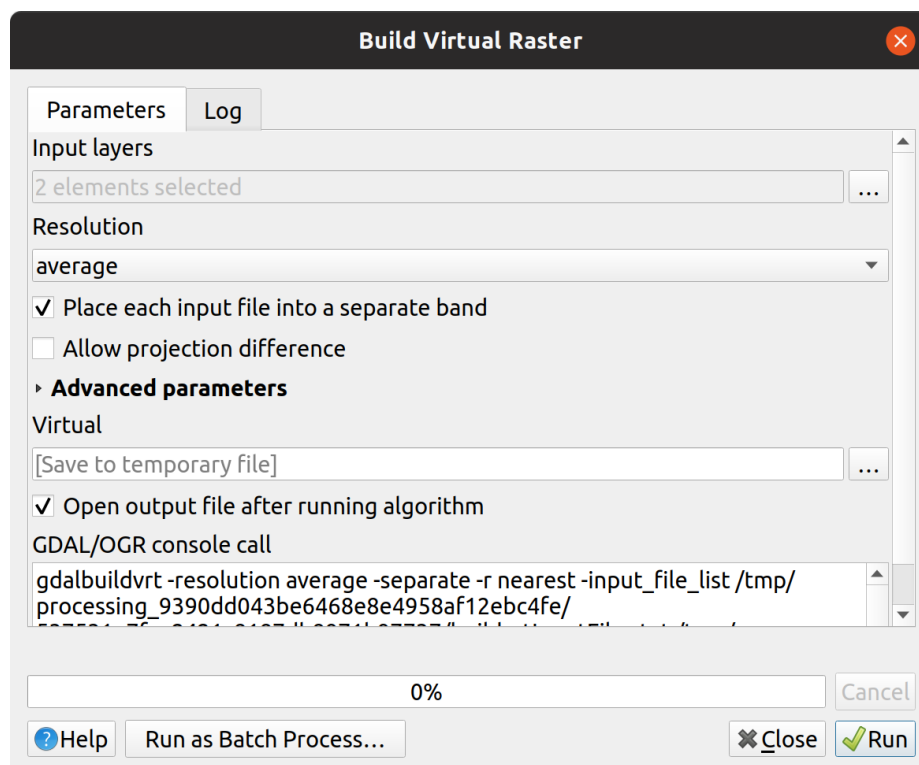

Then click OK. You can also enhance the contrast of the band using the Symbology property. Repeat this action for all bands.
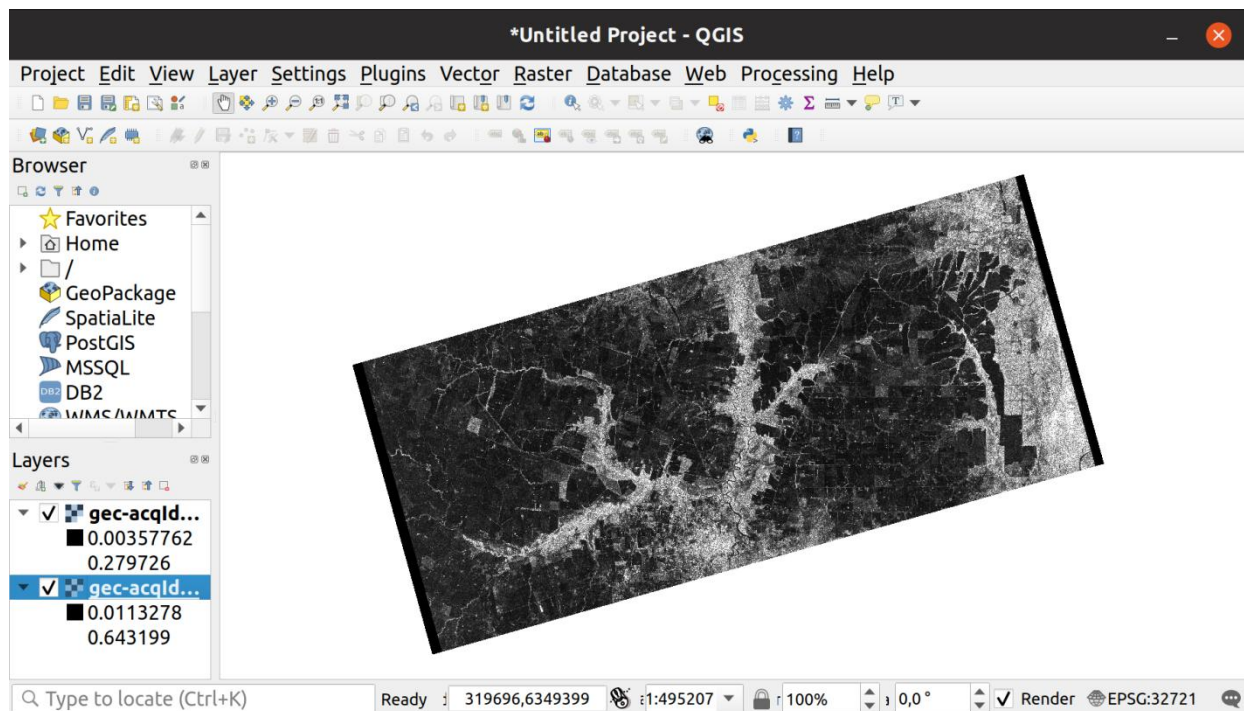
5. To stack the bands click

Raster>Miscellaneous>Build Virtual Raster

Then select in the *Input layers* field those layers you want to stack by clicking the [...] button on the right.

Choose the name of the output file and the folder where this file will be saved. Then click Run to stack the bands.

6. QGIS will show by default a combination of RGB bands (in this example: HH, HV, No set). You can change it by right clicking on the new layer created in Layers, then choosing Properties..., and in the Symbology field select the band for the Red channel (red colour), the band for the Green channel (green color), and the band for the Blue channel (blue color). You can also choose not to select any band for a certain channel by choosing *No set*.