

# **Instruction to Work with M3 Level2 Data in ENVI**

# Part 1. Data downloading from ODE

<https://ode.rsl.wustl.edu/moon/indexProductSearch.aspx>

- Download the Level2 M3 REFIMG data from ODE, e.g., M3G20090203T163629\_V01\_RFL.img, please download the ENVI header \*\_rfl.hdr and label file \*\_L2.LBL together with the PDS \*\_rfl.img data file.

The screenshot displays the ODE (Open Data Explorer) interface. The top navigation bar includes links for Home, Data Product Search, Map Search, Tools, Data Set Browser, Download, and Help & Resources. The main content area is divided into two sections. The left section, titled 'SEARCH RESULTS', shows 'Products Found: 1' and a table with one entry: 'CH1-ORB M3 Reflectance Image (REFIMG) (Derived Data)' with the identifier 'M3G20090203T163629\_V01\_RFL' and an observation time of '2009-02-03T16:44:24'. The right section, titled 'M3G20090203T163629\_V01\_RFL', provides details for this product, including its description as 'CH1-ORB M3 Reflectance Image (REFIMG) (Derived Data)'. It features tabs for 'Browse', 'Meta Data', 'Label', 'Related Products', and 'Map Context'. The 'Browse' tab is selected, showing a list of product files and labels with their sizes in KB. The files listed are: 'm3q20090203t163629\_v01\_l2.lbl' (8 KB), 'm3q20090203t163629\_v01\_rfl.hdr' (38 KB), 'm3q20090203t163629\_v01\_rfl.img' (921,001 KB), 'm3q20090203t163629\_v01\_sup.hdr' (1 KB), 'm3q20090203t163629\_v01\_sup.img' (33,001 KB), 'm3q20090203t163629\_v01\_rfl.img.vrt' (49 KB), and 'm3q20090203t163629\_v01\_sup.img.vrt' (2 KB).

Product Files & Labels	KB
<a href="#">m3q20090203t163629_v01_l2.lbl</a> Product Label File	8
<a href="#">m3q20090203t163629_v01_rfl.hdr</a> Product Data File	38
<a href="#">m3q20090203t163629_v01_rfl.img</a> Product Data File	921,001
<a href="#">m3q20090203t163629_v01_sup.hdr</a> Product Data File	1
<a href="#">m3q20090203t163629_v01_sup.img</a> Product Data File	33,001
<a href="#">m3q20090203t163629_v01_rfl.img.vrt</a> IMG VRT File	49
<a href="#">m3q20090203t163629_v01_sup.img.vrt</a> SUP VRT File	2

Fig. 1 Product detail page of the search result 'M3G20090203T163629\_V01\_RFL.img'

# Find the Location Data

- Open the label file M3G20090203T163629\_V01\_L2.LBL, find the information as copied below.

```
/* Level 1B radiance image product and the associated observational */  
/* geometry and pixel location (longitude, latitude, and radius) */  
/* files used as sources for this reflectance product. */
```

```
SOURCE_DATA_SET_ID          = "CH1-ORB-L-M3-4-L1B-RADIANCE-V3.0"  
SOURCE_PRODUCT_ID           = "M3G20090203T163629_V03_RDN"  
CH1:RADIANCE_IMAGE_FILE_NAME = "M3G20090203T163629_V03_RDN.IMG"  
CH1:OBS_GEOMETRY_FILE_NAME   = "M3G20090203T163629_V03_OBS.IMG"  
CH1:PIXEL_LOCATION_FILE_NAME = "M3G20090203T163629_V03_LOC.IMG"
```

- So the file 'M3G20090203T163629\_V03\_LOC.IMG' is the corresponding location data related to the reflectance product, which can be downloaded by clicking the Related Products tab in Fig. 1 in Slide 2.

# Download the Location Data

M3G20090203T163629\_V01\_RFL  
CH1-ORB M3 Reflectance Image (REFIMG) (Derived Data)

[Product Description and Data Set Documents \(click to show\)](#)

[Browse](#) [Meta Data](#) [Label](#) [Related Products](#) [Map Context](#)

**Associated Products**

Current Product - [Related and Source Products](#)

Products Found: 1

Sort Order: [Mission/Instrument](#) [Ascending](#) [Sort](#)

[CH1-ORB M3 Calibrated Image Version 3 \(CALIV3\) \(Calibrated Data\)](#)  
[M3G20090203T163629\\_V03\\_RDN](#) Obs Time: 2009-02-03T16:44:24

Fig. 2 Related Products for the reflectance product  
'M3G20090203T163629\_V01\_v01\_rfl.img'

- As shown in Fig. 2, click the link for product 'M3G20090203T163629\_V03\_RDN', it opens another window as shown in Fig. 3, the pixel location data (\*\_LOC.IMG) and the observation geometry data (\*\_OBS.IMG) together with their ENVI headers (\*.hdr) can be downloaded from the webpage directly.

M3G20090203T163629\_V03\_RDN  
CH1-ORB M3 Calibrated Image Version 3 (CALIV3) (Calibrated Data)

[Product Description and Data Set Documents \(click to show\)](#)

[Browse](#) [Meta Data](#) [Label](#) [Related Products](#) [Map Context](#)

No product browse version is available.

[Add Product to Cart](#) [Remove Product from Cart](#) [Cart & Download Help](#)

Indicates a download link from another PDS data node.

**PDS Product Files** **Derived Files**

Product Files & Labels	KB
<a href="#">m3g20090203t163629_v03_lib.lbl</a> Product Label File	21
<a href="#">m3g20090203t163629_v03_loc.hdr</a> Product Data File	1
<a href="#">m3g20090203t163629_v03_loc.img</a> Product Data File	65,001
<a href="#">m3g20090203t163629_v03_obs.hdr</a> Product Data File	1
<a href="#">m3g20090203t163629_v03_obs.img</a> Product Data File	108,001
<a href="#">m3g20090203t163629_v03_rdn.hdr</a> Product Data File	36
<a href="#">m3g20090203t163629_v03_rdn.img</a> Product Data File	921,001
<a href="#">m3g20090203t163629_v03_tim.tab</a> Product Data File	521

**Referenced Files** **KB**

<a href="#">lib_nav_desc.asc</a> Description File	6
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**Product Summary** **PDS**

PDS Version	3
Instrument Host ID	CH1-ORB
Instrument ID	M3
Product Type	CALIV3
Observation Type	
Observation ID	
Observation Number	
Observation Time	2009-02-03T16:44:24.500

Fig. 3

# Part 2. Georeference from IGM in ENVI (using ENVI 5.4 as an example)

- Start ENVI 5.4, go to File -> Data Manager

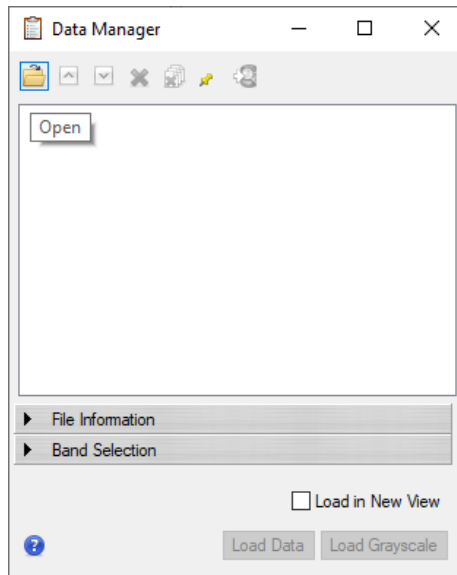


Fig. 4 Data manager window

- From Data Manager, click the yellow folder to open the reflectance product 'M3G20090203T163629\_v01\_rfl.img' and the location file 'M3G20090203T163629\_V03\_LOC.IMG'

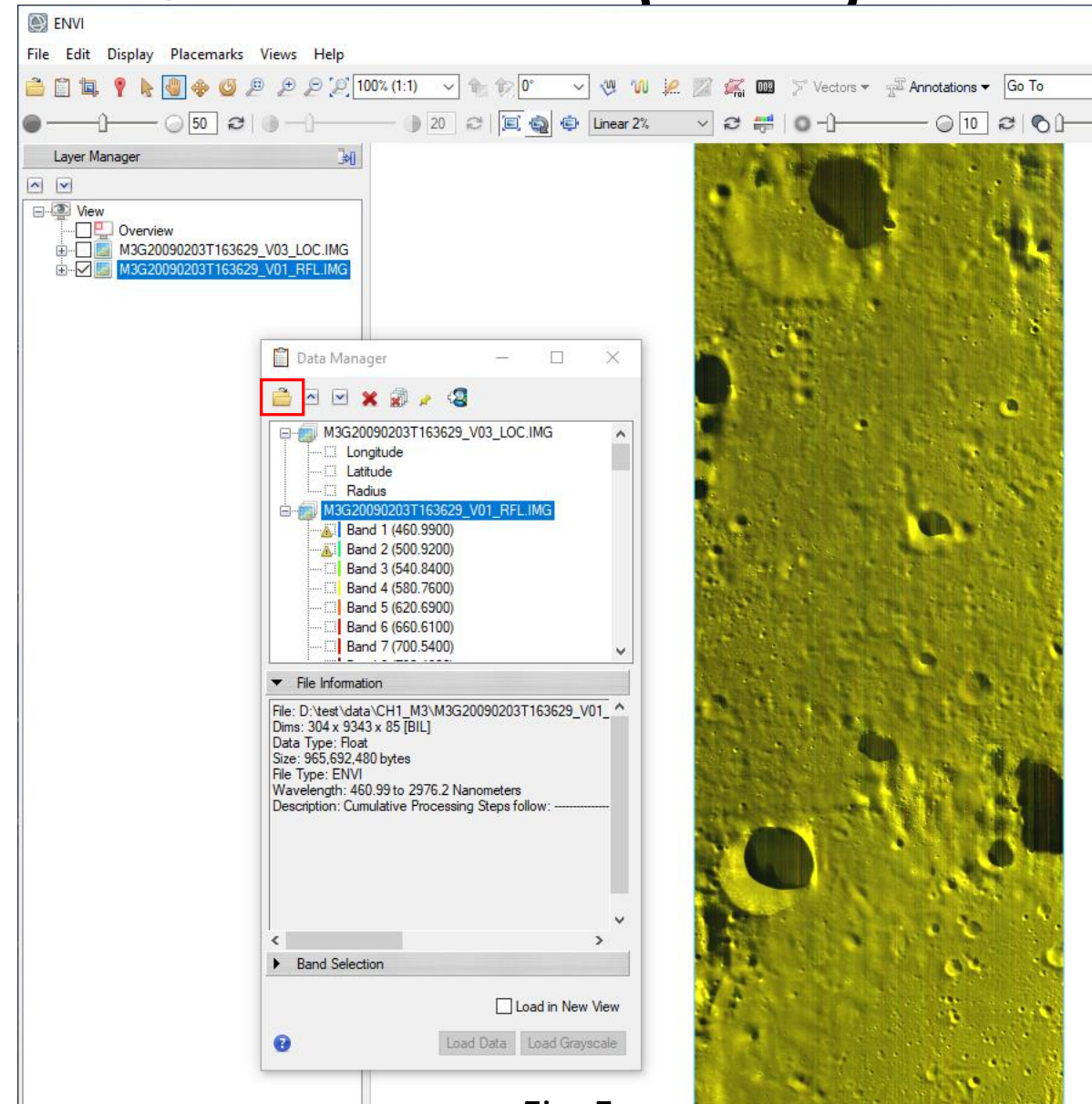


Fig. 5

# Georeference from IGM – Con't

- In Toolbox, go to Geometric Correction, double click Georeference from IGM (Fig. 6). In the pop-up 'Input Data File' window, select the reflectance product as the select input file as shown in fig. 7. Click OK.

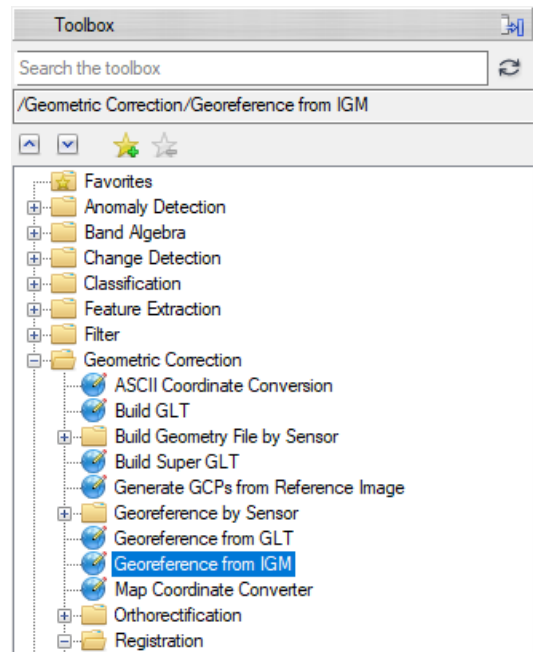


Fig. 6

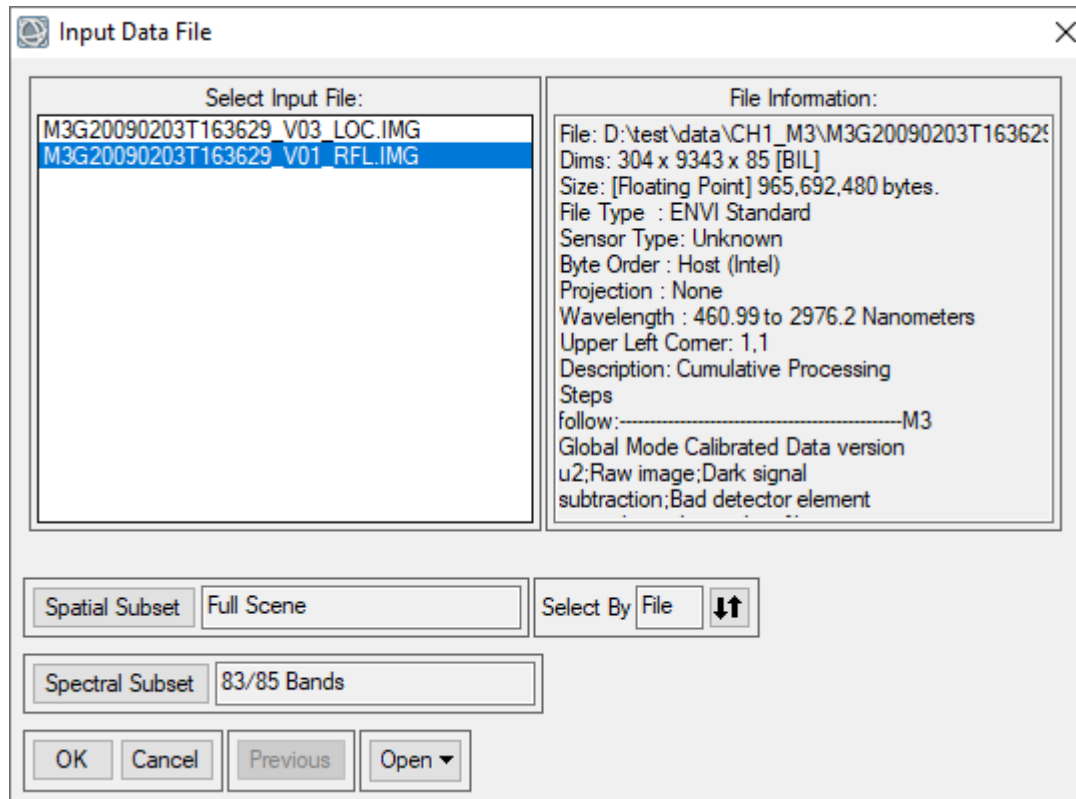


Fig. 7

# Georeference from IGM – Con't

- In the next pop-up 'Input X Geometry Band' window, select Longitude band of the location product 'M3G20090203T163629\_V03\_LOC.IMG' as shown in Fig. 8. Click OK. And in the pop-up 'Input Y Geometry Band' window, select Latitude band of the same location product as shown in Fig. 9. Click OK again.

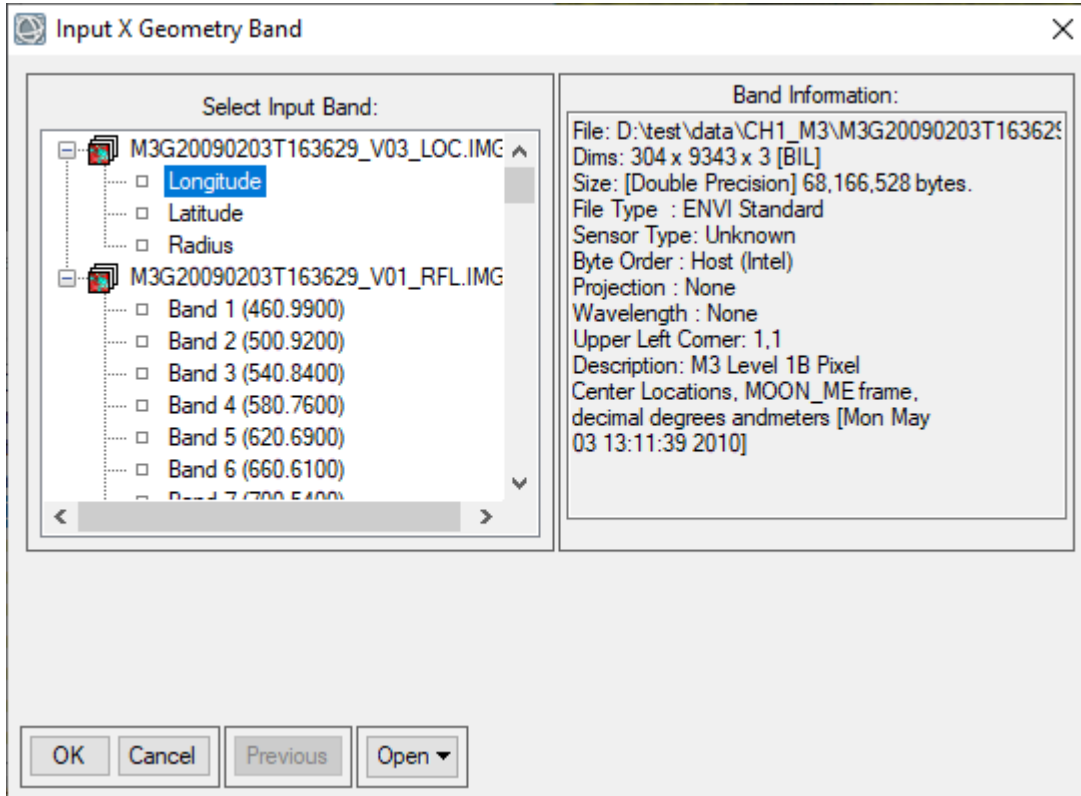


Fig. 8

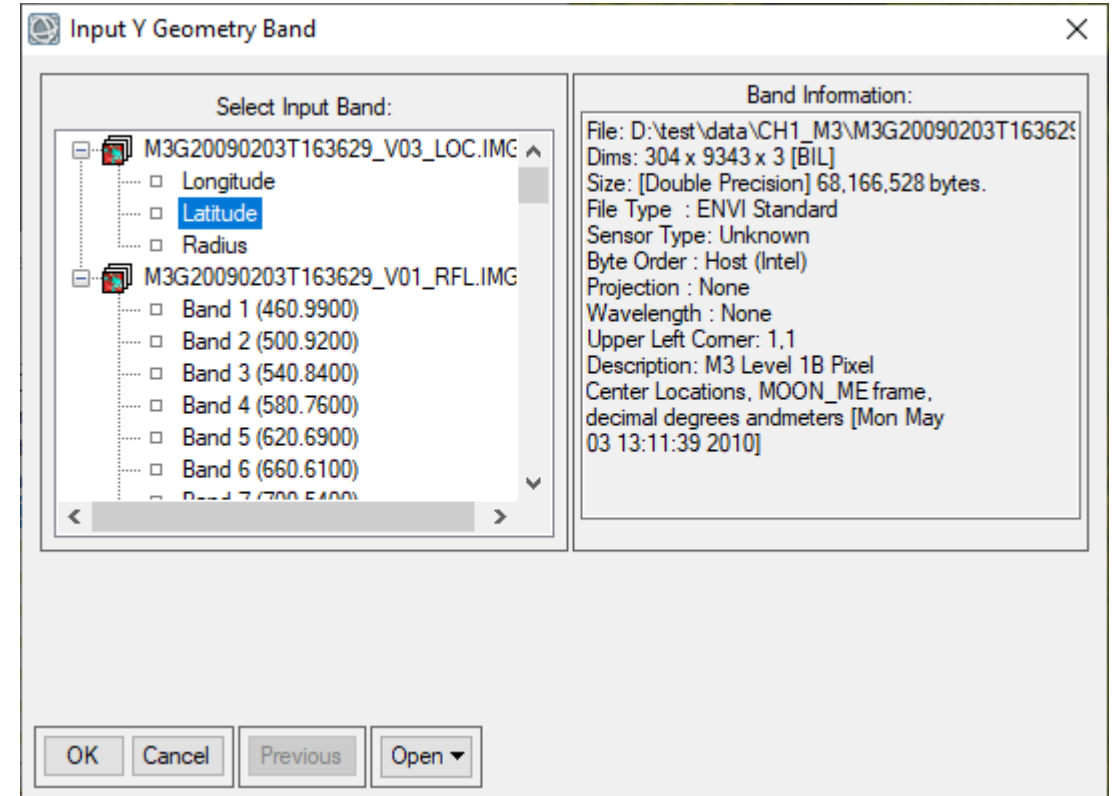


Fig. 9

# Set Projection Information for The Input And Output

- In the pop-up 'Geometry Projection Information' window, set the projection information as shown in Fig. 10, click OK.

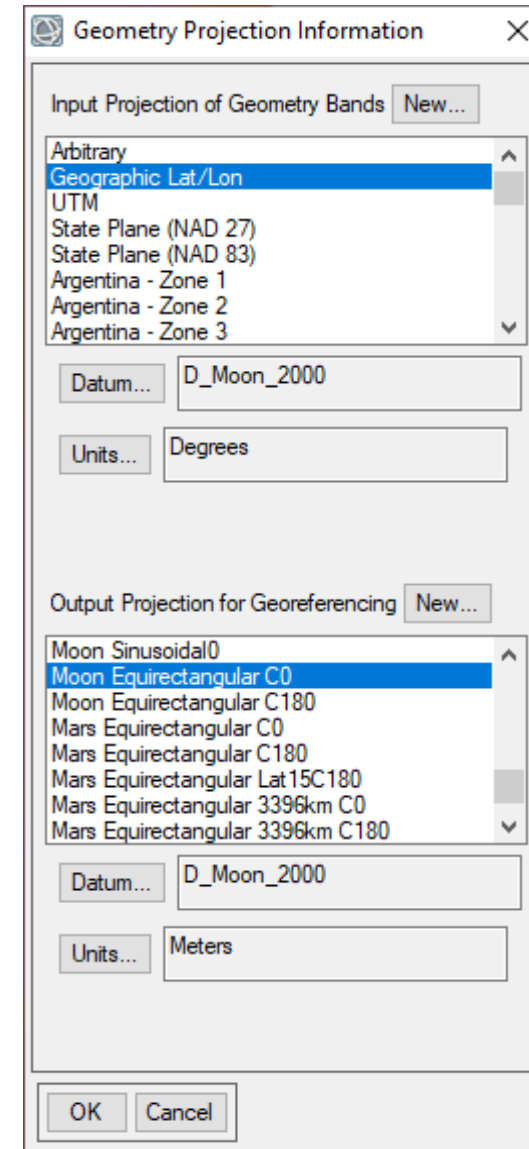


Fig. 10



- In the pop-up 'Build Geometry Lookup File Parameters' window, use the default setting for the pixel size, set output rotation as 0 and set the outputfile name as shown in Fig. 11, click OK.
- ENVI will start the process of Georeference from IGM. It might take a while to get the output result 'M3G20090203T163629\_v01\_rfl\_prj.dat'

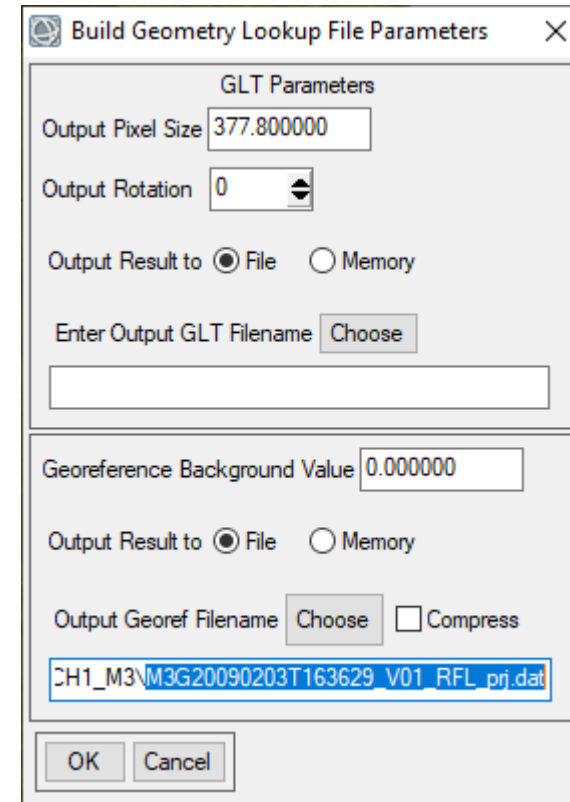


Fig. 11