

Preparing a DEM for GAMMA

Assuming you are using an ASTER or SRTM DEM in tiff format:

Software: ARCGIS (ENVI is also applicable)

1- Mosaic (Mosaic to new Raster (Data Management Tool)) or clip (Clip (Data Management Tool)) DEM tiles, if necessary

2- Open DEM.tif and use "Project Raster (Data Management Tool)" to transform LAT/LONG into UTM Coordinates

3- Right click on the data file to obtain information on the data properties (format, number of columns and rows, cell size, projection, etc. – this information is important for you to create the dem_par later on!)

4- Right click on the data file -> Data -> Export data (name_of_arcgis_dem.tif), make sure to set NoData as 0 (While in a DEM typically the value 0 represents elevation of 0 m, in the GAMMA software the value 0 is used for missing values. Replacing values, i.e. 0 values to 1 (short integer) or 0.1 (for real-valued data) and NoData values to 0, can be done in GAMMA as well, therefore use the command *replace values*)

MATLAB

```
tile=imread('name_of_arcgis_dem.tif','tiff');
t=transpose(tile);
fid=fopen('name_of_output_gamma_dem.dem','w','ieee-be');
io=fwrite(fid,t,'real*4','ieee-be');
fclose(fid);
```

GAMMA

create_dem_par

Your dem_par should look something like this:

Inylchek_SRTM_UTM_real.dem_par

Gamma DIFF&GEO DEM/MAP parameter file

title: Inylchek_SRTM_UTM_DEM

DEM_projection: UTM

data_format: REAL*4

DEM_hgt_offset: 0.00000

DEM_scale: 1.00000

width: 3791

nlines: 4443

corner_north: 4725050.000 m

corner_east: 364450.000 m

post_north: -25.0000000 m

post_east: 25.0000000 m

ellipsoid_name: WGS 84

ellipsoid_ra: 6378137.000 m
ellipsoid_reciprocal_flattening: 298.2572236

datum_name: WGS 1984
datum_shift_dx: 0.000 m
datum_shift_dy: 0.000 m
datum_shift_dz: 0.000 m
datum_scale_m: 0.00000e+00
datum_rotation_alpha: 0.00000e+00 arc-sec
datum_rotation_beta: 0.00000e+00 arc-sec
datum_rotation_gamma: 0.00000e+00 arc-sec
datum_country_list Global Definition, WGS84, World

projection_name: UTM
projection_zone: 44
false_easting: 500000.000 m
false_northing: 0.000 m
projection_k0: 0.9996000
center_longitude: 81.0000000 decimal degrees
center_latitude: 0.0000000 decimal degrees

Note that the format is real*4, like the export format that has been used by Matlab.

Please remember to oversample the DEM to approximately fit the resolution of your SAR data!
Therefore change the two input parameters lat_ovr and lon_ovr in the 2PASS_INT_NR_TSX.csh script.
To find the right values you need to consider the input resolution of your DEM and the multilook factors that you apply to your SAR data. Both, the SAR data and the DEM should have approximately the same final resolution.