

GUIDELINE

GMTSAR – STAMPS Convert for Small Baselines (SB) Networks

Sentinel 1A-B TOPS data

Noorlaila Isya
noorlaila@geodesy.its.ac.id

STEP 1:

Convert GMTSAR to STAMPS (SB Processing)

1. Set `gmtsar2stamps_sb` to your bash environment (\$ `pico ~/.bashrc`)

```
export gmtsar2stamps=/home/isya/STAMPS/gmtsar2stamps-master
export PATH=$gmtsar2stamps:$PATH
```

2. Go to raw folder
3. Run *dispersion_sb.sh* to generate amplitude difference dispersion values

dispersion_sb.sh PRM.list scatter.grd <rng0>/<rngf>/<azi0>/<azif> sbas.list

PRM.list -- a list of PRM files of the aligned SLC
sbas.list -- a list of PRM files of the aligned SLC for master-slave pairs
scatter.grd -- output scattering coefficient grid
<rng0>/<rngf>/<azi0>/<azif> — region of interests in radar coordinates

4. Create PRM.list based on raw_orig PRM files
5. Create sbas.list based on intf.in content (or do manually)
6. ROI in radar coordinates is the same as region_cut variable from batch_tops.config

STEP 2;

Convert GMTSAR to STAMPS (SB Processing)

Terminal :

```
$ cd ../raw
$ ls -1 *ALL_F1.PRM --ignore="PRM.list*" > PRM.list
$ cp ../intf.in sbas.list
$ sed -i -e 's/[:] /g' sbas.list
$ region=$(grep region_cut ../batch_tops.config | awk '{print $3}')
$ echo $region
$ dispersion_sbas.sh PRM.list scatter.grd $region sbas.list
```

STEP 3:

Convert GMTSAR to STAMPS (SB Processing)

1. Go to stack directory and create PS folder (if not exist) on stack folder
2. Go to PS dir and copy *mt_prep_gmtsar_sbas*
3. Modify the variables on set parameters and run *mt_prep_gmtsar_sbas*
 - region = crop area (xmin/xmax(ymin/ymax) on radar coordinates
[cek region from scatter.grd on raw folder **\$ gmt grdinfo scatter.grd]**]
 - R = number of patches in range
 - A = number of patches in azimuth
 - ov_R = overlapping pixels between patches in range
 - ov_A = overlapping pixels patches in azimuth
 - crop = PATH for imaginary and real files (the region has to be same as scatter.grd)
 - threshold = amplitude difference dispersion (0.4-0.6 is reasonable)
 - raw = PATH for raw directory
 - raw_orig = PATH for raw_orig directory
 - topo = PATH for topo directory
 - SLC = PATH to SLC files (same as raw directory)
 - heading = heading angle or azimuth direction for Sentinel-1, see metadata super master file
(e.g, Asc = 12.00707218611660e ; Dsc = -1.6799e+02)
 - master_date = supermaster date
4. Create **date_no_master.txt** which contains date list without master date (manual, no terminal command !)
5. Copy *intf.in* and modify the name of variables to be date variables, rename to **intf_list.in**

STEP 4;

Convert GMTSAR to STAMPS (SB Processing)

mt_perp_gmtsar_sbas example parameters

```
# mt_prep gmtsar for SBAS configuration

##### set parameters #####
region="500/20000/500/5000"
R=3
A=2
ov_R=100
ov_A=50
crop=/home/isya/APPS/sentinel-1/mexicali/batch_dsc/stack/crop
threshold="0.4"
raw=/home/isya/APPS/sentinel-1/mexicali/batch_dsc/raw
raw_orig=/home/isya/APPS/sentinel-1/mexicali/batch_dsc/raw_orig
topo=/home/isya/APPS/sentinel-1/mexicali/batch_dsc/topo
SLC=/home/isya/APPS/sentinel-1/mexicali/batch_dsc/raw
heading=-1.6799e+02 # for descending, for ascending: -12.00707218611660e
master_date=20150403
#####

# file input (must be put on PS folder):

#           date_no_master.txt
#           intf_list.in
```

Terminal :

```
$ cd ../stack
$ mkdir PS
$ cd PS
$ cp ../intf.in .
$ sed -i -e 's/[[:]]/ /g' intf.in
$ cat intf.in | sed "s/S1A//g" | sed "s/_ALL_F1//g" > intf_list.in
$ rm intf.in
$ ./mt_prep_gmtsar_sbas
```

mt_prep_gmtsar_sbas result

```
isya@hermes:~/APPS/sentinel-1/mexicali/batch_dsc/stack/PS$ tree -d
```

```
.
├── cands_1
├── cands_2
├── cands_3
├── cands_4
├── cands_5
├── cands_6
├── patch_reg
│   ├── PATCH_1
│   ├── PATCH_2
│   ├── PATCH_3
│   ├── PATCH_4
│   ├── PATCH_5
│   └── PATCH_6
└── SMALL_BASELINES
    ├── PATCH_1
    ├── PATCH_2
    ├── PATCH_3
    ├── PATCH_4
    ├── PATCH_5
    └── PATCH_6
```

20 directories

```
isya@hermes:~/APPS/sentinel-1/mexicali/batch_dsc/stack/PS$ cd SMALL_BASELINES/
isya@hermes:~/APPS/sentinel-1/mexicali/batch_dsc/stack/PS/SMALL_BASELINES$ tree
```

```
.
├── bperp.1.in -> ../bperp.1.in
├── bperp_20150109.1.in -> ../bperp_20150109.1.in
├── bperp_20150121.1.in -> ../bperp_20150121.1.in
├── bperp_20150310.1.in -> ../bperp_20150310.1.in
├── bperp_20150427.1.in -> ../bperp_20150427.1.in
├── bperp_20150521.1.in -> ../bperp_20150521.1.in
├── bperp_20150602.1.in -> ../bperp_20150602.1.in
├── bperp_20150614.1.in -> ../bperp_20150614.1.in
├── day.1.in -> ../day.1.in
├── heading.1.in -> ../heading.1.in
├── ifgday.1.in -> ../ifgday.1.in
├── intf_list.in -> ../intf_list.in
├── lambda.1.in -> ../lambda.1.in
├── len.txt
├── look_angle.1.in -> ../look_angle.1.in
├── master_day.1.in -> ../master_day.1.in
├── parms.mat
├── PATCH_1
│   ├── ifgday.1.in -> /home/isya/APPS/sentinel-1/mexicali/batch_dsc/stack/PS/ifgday.1.in
│   ├── patch.in
│   ├── patch_noover.in
│   ├── pscands.1.da
│   ├── pscands.1.hgt
│   ├── pscands.1.ij
│   ├── pscands.1.ll
│   ├── pscands.1.ph
│   ├── pscands.1.ph0
│   └── swap_pixels.m
├── PATCH_2
│   ├── ifgday.1.in -> /home/isya/APPS/sentinel-1/mexicali/batch_dsc/stack/PS/ifgday.1.in
│   ├── patch.in
│   ├── patch_noover.in
│   ├── pscands.1.da
│   ├── pscands.1.hgt
│   ├── pscands.1.ij
│   ├── pscands.1.ll
│   ├── pscands.1.ph
│   ├── pscands.1.ph0
│   └── swap_pixels.m
├── PATCH_3
│   ├── ifgday.1.in -> /home/isya/APPS/sentinel-1/mexicali/batch_dsc/stack/PS/ifgday.1.in
│   ├── patch.in
│   ├── patch_noover.in
│   ├── pscands.1.da
│   ├── pscands.1.hgt
│   ├── pscands.1.ij
│   ├── pscands.1.ll
│   ├── pscands.1.ph
│   ├── pscands.1.ph0
│   └── swap_pixels.m
```

STEP 5; STAMPS (SB Processing)

1. Go to SMALL_BASELINES directory \$ cd SMALL_BASELINES
2. Type \$ matlab
3. Start working with STAMPS
4. Read StaMPS/MTI manual, to test the succesfull gmtsar format, type

```
>> stamps(1,1) %or  
>> stamps(1,5)
```

5. If there is a problem with unmatched pixels for pscands* files, go to PS directory and try to fix the bugs using script *fix_pscands.sh*
6. If everything seems okay, start working on STAMPS. >> stamps(1,8)