Altimeter documents

Recipes on altimeter data processing to get the best mean sea surface slope

Using Sentinel-3A/B as examples

Step 1:

Reading original (\*.nc) files where there are hundreds of parameters and dump the 20 hz values we want to binary format.

code directory:

/cryostat/mgg/alt/rfmt\_s3

data structure:

s3ab20hz.h

code:

s3ab20hz \*.nc >> outfile

working directory:

S3/cdr (in external disk Sentinel 3)

scripts:

process\_all\_step1\_S3A.csh

process\_all\_step1\_S3B.csh

input: \*.nc files

output (binary): S3A.S20, S3B.S20

to look at the output:

gmtconvert S3A.S20 -bi11i,i8h | more

Step 2: to get \*.int

edit bad data (flag, swh, ssha, mqe) then low-pass filtered into 5/sec data

code directory:

/cryostat/mgg/alt/retrack/src/s3ab20\_cdr

code:

s3ab20\_cdr 1 S3A.S20 sentinel3Aa.int sentinel3Ad.int 1

s3ab20\_cdr 1 S3B.S20 sentinel3Ba.int sentinel3Bd.int 0

filter: 99-point Parks-McClellan filter

working directory:

S3/cdr (in external disk Sentinel 3)

scripts:

process\_all\_cdr\_step2.csh

input: S3A.S20, S3B.S20

output (binary): sentinela.int, sentineld.int

to look at the output:

gmtconvert sentinela.int -bi7i | more

or

fmtcdr sentinela.int | more

Step 3: to get \*.edt, \*.flt, \*.cor, \*.binc

Edit with respect to EGM2008 when along track slope of the data minus the global grid of sea surface height exceeds a threshold;

Filter altimeter data along track;

Apply slope correction;

Make binary xyds files for global gridding programs.

code directory:

cryosat/mgg/alt/cdr/src

working directory:

cryosat2/gravity/filtered\_data

scripts:

prepare\_sentinel.com

\*.edt, \*.flt, \*.cor are in 28-byte binary format

fmtcdr \*.edt/\*.flt/\*.cor | more

or

gmtconvert \*.edt/\*.flt/\*.cor -bi7i| more

utcsec (s)

microsec (1e-6)

lat (1e-6)

lon (1e-6)

ssh (alt-range, 0.1 mm)

swh (0.1 mm)

???

\*.binc are in 16-byte binary format (lon, lat, vertical deflection, sigma)

gmtconvert \*.binc -bi4i | more

Step 4: to get \*.img and north\_tot.img/east\_tot.img

read xyds (\*.binc) data from either ascending or descending and use block mean to fill the img world Mercator i\*2 files.

Code directory:

/cryostat/mgg/alt/grav\_img

img\_ds\_bm -D -S -F

Working directory:

/cryosat2/gravity/1min\_V29

Script to produce individual \*.img:

pre\_prcoc\_sentinel.com

script to combine \*.img together (to get northd.img/eastd.img):

interp\_\*.com

script to get full slope (to get north\_tot.img/east\_tot.img):

not sure