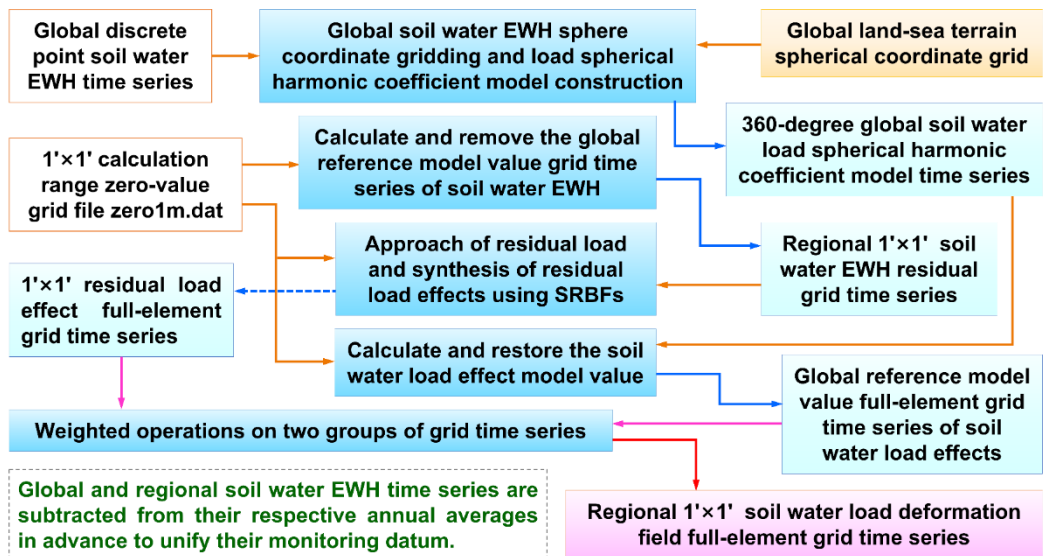


Complete computation processes of high-resolution regional load deformation field time series

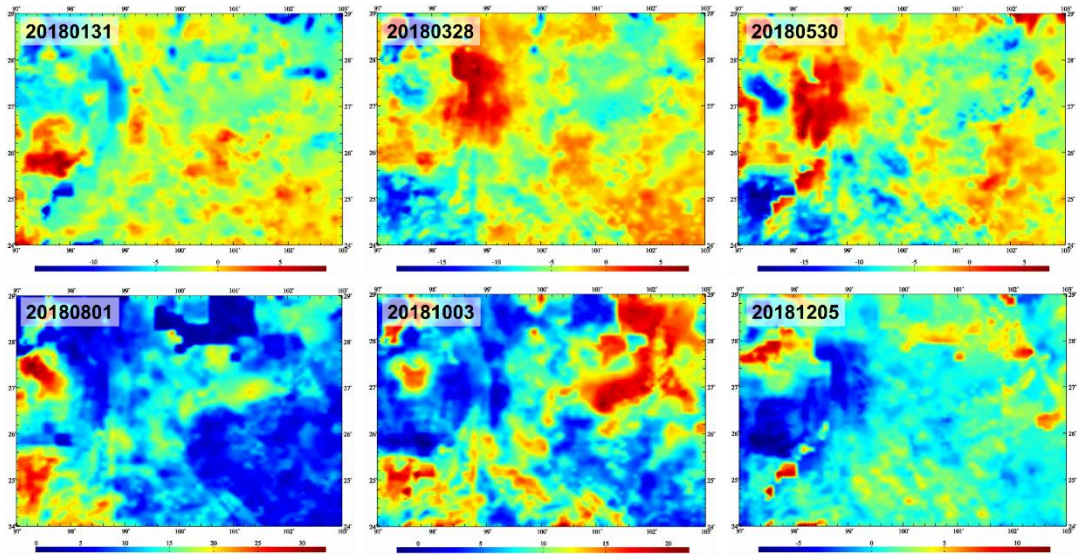
Taking the regional soil water variations as the example, the remove-restore scheme combined the global load spherical harmonic coefficient synthesis and regional residual load SRBF (spherical radial basis function) approach is employed to compute the high-precision and high-resolution regional load deformation field full-element grid time series in the near-Earth space in the four-step.

The soil water here consists of soil water in 4 m shallow, wetland water, vegetation water, glaciers, and snow mountain water, but does not include lakes, rivers, and groundwater.

The global soil water equivalent water height (EWH) time series and the regional high-resolution soil water EWH time series are subtracted from their respective annual averages in advance to unify the global and regional soil water variation monitoring datum.



Complete computation processes of regional load deformation field full-element grid time series



Regional 1'x1' soil water equivalent water height (EWH, cm) grid time series

The complete computation process of the high-resolution regional load deformation field full-element grid time series consists of four steps usually: global surface load spherical harmonic analysis, load deformation field spherical harmonic synthesis, regional residual load spectral domain SRBF approach and residual load deformation field SRBF synthesis.

Step 1: Construct the global terrestrial soil water EWH spherical coordinate grid time series, and then establish the global soil water load spherical harmonic coefficient model time series.

Call the function [Construction of global surface data grid in spherical coordinates], construct the global soil water EWH spherical coordinate grid time series `glslewh*.dat` from global soil water observations, where * is the sample epoch time and * = 20180131 represents January 31, 2018. The process is omitted in this example.

Call the function [Spherical harmonic analysis on global land water variations], input global land-sea terrain spherical coordinate grid `sphETOPOnC30m.dat` (EWH automatically zero in sea area), whose resolution is not less than the soil water EWH grid, and establish the global soil water load spherical harmonic coefficient model time series `Indwater*.cs.dat` from the global soil water EWH spherical coordinate grid time series `glslewh*.dat`.

Step 1: Construct the global terrestrial soil water EWH spherical coordinate grid time series, and then establish the global soil water load spherical harmonic coefficient model time series.

Construction of global surface data grid in spherical coordinates | Spherical harmonic analysis on global surface atmosphere variations | **Spherical harmonic analysis on global land water variations** | Spherical harmonic analysis on global sea level variations

Open any land water spherical coordinate grid file

Set the wildcards of the file names
 Ordinal number of first wildcard in the file name: 10
 Number of consecutive wildcards in file name: 8

Set termination condition of the iteration
 Residual standard deviation threshold (a): 1.0‰
 Termination condition of residual decrease (b): 1.0‰

Open the land-sea terrain spherical coordinate grid file

The surface harmonic functions in the spherical harmonic coefficient model are defined on the spherical surface whose radius is equal to the semi-major axis a of the Earth.

Program Process ** Operation Prompts

```

sphETOPO30m.dat
>> Create or select the result files folder C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel.
** The spherical coordinate grid files searched by wildcard instantiation:
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20180131*.dat
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20180328*.dat
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20180530*.dat
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20180801*.dat
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20181003*.dat
C:/ETideLoad4_5_win64en/examples/Loadmfdfcalcdemo/gisolew*20181205*.dat
>> Setting parameters have been imported in the program!
** Click the control button [Start computation], or the tool button [Start computation]...
>> Computation start time: 2023-05-17 14:44:46
>> Complete the spherical harmonic analysis for 6 land water variation grids!
** The program outputs the land water load spherical harmonic coefficient model files lndwater*.cs.dat iteration process statistics files pro*.in and residual land water variation grid files rmt*.dat. ** is the instance of the given wildcards.
  
```

Set the results folder | Input setting parameters | Start computation

lndwater(20180131).dat	lndwater(20180328).dat	lndwater(20180530).dat	lndwater(20180801).dat	lndwater(20181003).dat	lndwater(20181205).dat
0.0	360.0	-90.0	90.0	0.50000000	0.50000000
2734.91	2735.40	2735.93	2736.53	2737.08	2737.61
2743.65	2744.20	2744.92	2745.57	2746.21	2746.86
2750.11	2750.77	2751.40	2752.01	2752.67	2753.35
2760.35	2761.11	2761.88	2762.73	2763.43	2764.18
2770.00	2770.85	2771.70	2772.55	2773.40	2774.25
2780.00	2780.00	2780.00	2780.00	2780.00	2780.00
2790.00	2790.00	2790.00	2790.00	2790.00	2790.00
2800.00	2800.00	2800.00	2800.00	2800.00	2800.00
2810.00	2810.00	2810.00	2810.00	2810.00	2810.00
2820.00	2820.00	2820.00	2820.00	2820.00	2820.00
2830.00	2830.00	2830.00	2830.00	2830.00	2830.00
2840.00	2840.00	2840.00	2840.00	2840.00	2840.00
2850.00	2850.00	2850.00	2850.00	2850.00	2850.00
2860.00	2860.00	2860.00	2860.00	2860.00	2860.00
2870.00	2870.00	2870.00	2870.00	2870.00	2870.00
2880.00	2880.00	2880.00	2880.00	2880.00	2880.00
2890.00	2890.00	2890.00	2890.00	2890.00	2890.00
2900.00	2900.00	2900.00	2900.00	2900.00	2900.00
2910.00	2910.00	2910.00	2910.00	2910.00	2910.00
2920.00	2920.00	2920.00	2920.00	2920.00	2920.00
2930.00	2930.00	2930.00	2930.00	2930.00	2930.00
2940.00	2940.00	2940.00	2940.00	2940.00	2940.00
2950.00	2950.00	2950.00	2950.00	2950.00	2950.00
2960.00	2960.00	2960.00	2960.00	2960.00	2960.00
2970.00	2970.00	2970.00	2970.00	2970.00	2970.00
2980.00	2980.00	2980.00	2980.00	2980.00	2980.00
2990.00	2990.00	2990.00	2990.00	2990.00	2990.00
3000.00	3000.00	3000.00	3000.00	3000.00	3000.00

1 3.996004418 6378137.00 0.5573 15.084 0.6721 3.2792 -46.8962 101.1671
 2 0.3435793110900616E-10 0.000000000000000E+00 0.0000 0.9831 -36.4558 78.2553
 3 9.2457930065939986E-10 0.000000000000000E+00 2806.8 3 2 0.0000 0.6284 -29.5272 71.0895
 4 1 9.0268254779166223E-10 -4.7574877498471504E-11 2814.92 4 3 0.0000 0.5630 -29.4347 68.2698
 5 2 1.0268254779166223E-10 -4.7574877498471504E-11 2818.74 5 4 0.0000 0.5380 -30.4293 67.2374
 6 3 3.6363130771720734E-10 3.5655990273019996E-10 2819.83 6 5 0.0000 0.5247 -30.8438 66.8759
 7 4 1.1913358E-11 -9.9000830184071023E-11 2818.87 7 6 0.0000 0.5165 -31.0211 66.7593
 8 5 3.721202E-09 0.000000000000000E+00 2817.73 8 7 0.0000 0.5109 -31.0974 66.7274
 9 3 1 3.6363130771720734E-10 3.5655990273019996E-10 2817.76 9 8 0.0000 0.5070 -31.1297 66.7218
 10 3 2 1.2302251091472584E-10 5.4106078115310523E-10 2819.66 10 9 0.0000 0.5039 -31.1430 66.7228
 11 4 3 -1.2507023908057166E-10 4.4584757452995267E-10 2823.47 11 10 0.0000 0.5016 -31.1482 66.7244
 12 4 0 -8.9924013483493641E-11 0.000000000000000E+00 2828.45 12 11 0.0000 0.4997 -31.1503 66.7251
 13 4 1 4.5981133876552335E-10 5.5019754977419413E-10 2833.92 13 12 0.0000 0.4981 -31.1511 66.7250
 14 4 2 7.6291176219970650E-11 6.8922364997196835E-11 2839.68 14 13 0.0000 0.4981 -31.1511 66.7250
 15 4 3 7.7885887494136359E-11 2.8188206515740033E-10 2845.14 15 14 0.0000 0.4981 -31.1511 66.7237
 2847.70 15 14 0.0000 0.4981 -31.1511 66.7237

number of iterations, mean, SD, minimum, maximum

The spherical harmonic coefficient degree n is equal to the number of grid-elements of global surface load grid in the latitude direction. For example, the $0.25^\circ \times 0.25^\circ$ global surface load grid corresponds to $n=720$.

Step 2: Calculate and remove the global reference model value grid time series of soil water EWH and construct the regional high-resolution soil water EWH residual grid time series.

Call the function [Computation of model value time series of load equivalent water height], input the 1'x1' zero-value grid file zero1m.dat, which is employed to give the calculation range and the zero-value represents the calculation surface as the ground, let 'land water EWH (cm)' as the surface load type and the maximum calculation degree 360, calculate the global reference model value grid time series ldewh*.dat of soil water EWH from the global soil water load spherical harmonic coefficient model time series lndwater*.cs.dat.

Computation of the load model value by spherical harmonic synthesis

Step 2: Calculate and remove the global reference model value grid time series of soil water EWH and construct the regional high-resolution soil water EWH residual grid time series.

Computation of model value of surface load equivalent water height

Computation of model values of tidal constituent harmonic parameters

Computation of model value time series of load equivalent water height

Program Process ** Operation Prompts

Save program process as

height (cm), or sea level variation (cm) on the given points in the input file.
 >> Open the calculation surface height grid file C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/zero1m.dat
 >> Open any load harmonic coefficient model file C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20180131.cs.dat.
 ** The window below only shows no more than 3000 rows of data in the file!
 ** Select or create the result folder C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/ewhmdl.
 ** The load harmonic coefficient model files searched by wildcard instantiation:
 C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20180131.cs.dat
 C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20180530.cs.dat
 C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20180901.cs.dat
 C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20181003.cs.dat
 C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/sphcsmodel/Indwater20181205.cs.dat
 >> Setting parameters have been imported in the program!
 ** Click the control button [Start computation], or the tool button [Start computation]...
 ** The computation process needs to wait... During the computation period, you can open the output file C:/ETidel.oad4.5_win64en/examples/Loadmfdfcalcdemo/ewhmdl to look at the computation progress!
 ** The last column attribute of each output file header is the instance of the wildcards of the file name of surface load harmonic coefficient model file, which represents the sampling epoch time of the output file.

Set the results folder Import setting parameters Start computation

Set the wildcard of the file names

Ordinal number of the first wildcard in the file name: 9

Number of consecutive wildcards in file name: 8

Type of surface load: Land water EWH (cm)

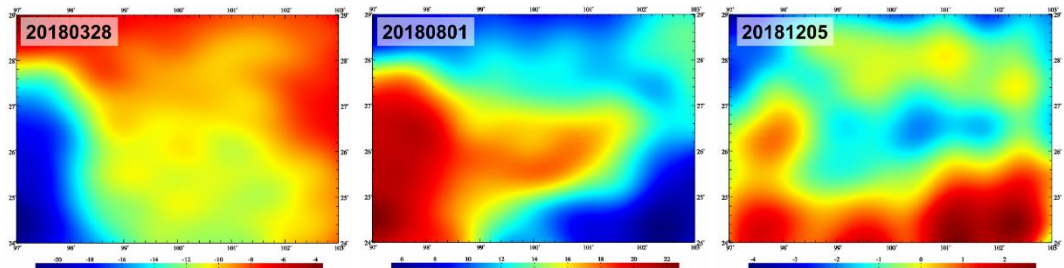
Maximum truncated degree of the coefficients model: 360

The surface harmonic coefficient functions in the spherical harmonic coefficient model are defined on the spherical surface whose radius is equal to the semi-major axis a of the Earth.

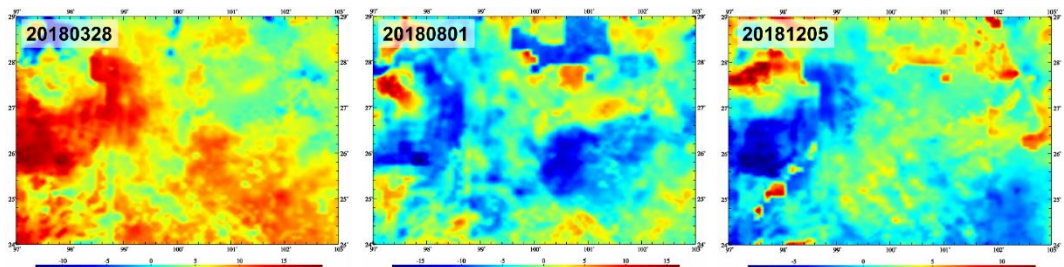
$GM(\times 10^{14} m^3/s^2)$	$a(m)$	zero-degree term (cm)	relative error(%)
3.986004419	6378137.00	0.5573	13.582
2	0	0.0000000000000000E+00	0.0000000000000000E+00
2	1	-0.02682547875367799E-10	-4.757487746655503E-11
3	1	0.0000000000000000E+00	0.0000000000000000E+00
3	2	0.0000000000000000E+00	0.0000000000000000E+00
4	1	4.59911338970353000E-10	5.5019754985236281E-11
4	2	7.6291176220002367E-11	6.8922364997197517E-11
4	3	7.7885987494120061E-11	2.8189206515737334E-11
4	4	-5.7623604746657341E-10	2.7890304486804297E-11
5	0	-1.3649176546033839E-09	0.0000000000000000E+00

In the remove-restore process, the program can be employed for regional tidal load effects refinement based on the tidal load spherical harmonic coefficient model, and for regional load deformation field and temporal gravity field approaching based on the surface load spherical harmonic model.

Due to the mixing effects between the high-degree spherical harmonic coefficients, the model values of the sea level variation and ocean tidal harmonic parameters are not zero in the coastal land area, and the model values of the land equivalent water height are not also zero in the coastal sea area.



Regional 1'x1' soil water EWH model reference value (cm) grid time series



Regional 1'x1' soil water EWH residual (cm) grid time series

Call the function [Weighted operations on two groups of grid time series], subtract the soil water EWH model value grid time series ldewh***.dat from the 1'x1' soil water EWH grid time series soilwh***.dat to generate the regional 1'x1' soil water EWH residual grid time series rntewh***.dat.

Step 3: Determine the residual full-element grid time series of regional soil water load deformation field by the load SRBF approach and load effect SRBF synthesis.

Call the function [Approach of residual load and synthesis of residual load effects using SRBFs], input the calculation result area 1'x1' zero-value grid file zero1mrst.dat removed the 1° edge area around the grid zero1m.dat, and generate the residual load effect full-element grid ttt.??? from regional 1'x1' soil water EWH residual grid rntewh***.dat at any epoch time to design the reasonable setting parameters according to the principle of parameter setting optimization and cumulative approach effectiveness given below the program interface.

Step 3: Using the load SRBF approach and load effect synthesis method, calculate the residual full-element grid time series of regional soil water load deformation field.

Design the reasonable setting parameters in advance according to the principle below

The effectiveness principle of the parameter optimization and cumulative approach: (1) The estimated load EWH and load effects in space is continuous and differentiable, and (2) the residual standard deviation of the estimated load EWHs is obviously reduced, and the residual statistical mean tends to zero.

Call the function [Computation of residual surface load and load effect time series using SRBFs], input the 1'x1' zero-value grid file zero1mrst.dat, and generate the residual load effect full-element grid time series rntSRBFs***.??? from regional 1'x1' soil water EWH residual grid time series wghcalc*.dat with the setting parameters above.

Where ??? = ewh, ksi, gra, rga, dft, vdf, dph, dpr, nmh, grr or hgd, respectively, representing the grid file of the residual EWH estimation and residual load effects on the height anomaly, ground gravity, gravity disturbance, ground tilt, vertical deflection, horizontal displacement, radial displacement, normal or orthometric height, disturbing gravity gradient or horizontal gravity gradient.

*** are the wildcards of the variation grid time series file names, whose instance can

identify the sampling epoch time of the load effects.

Step 3: Determine the residual full-element grid time series of regional soil water load deformation field by the load SRBF approach and load effect SRBF synthesis.

Approach of residual load and synthesis of residual load effects using SRBFs

Computation of residual surface load and load effect time series using SRBFs

Load approach and load effect synthesis algorithms using SRBFs

Select the calculation point file format
The calculation surface grid file
Open calculation surface zero value grid file
Open any residual equivalent water height variation grid file

Ordinal number of first wildcard in file name: 8
Number of consecutive wildcards in file name: 8

Parameters of the first SRBF approach

- Select SRBF: radial multipole kernel
- order m: 0
- minimum degree: 180
- maximum degree: 720
- burial depth of Bjerhammar sphere: 20.0km
- action distance of SRBF center: 150km
- Reuter network level K: 1800

Parameters of cumulative SRBF approach

- Select SRBF: Poisson wavelet kernel
- order m: 0
- minimum degree: 360
- maximum degree: 1800
- burial depth of Bjerhammar sphere: 10.0km
- action distance of SRBF center: 60km
- Reuter network level K: 1800

Computation start time: 2023-05-17 16:01:25

SRBF approach statistics of 20180131 load EWHs:
The source EWH observations (cm): Mean 3.3563 standard deviation 2.4427 minimum -8.4348 maximum 15.7512
The 0th iterated residual EWH (cm): Mean -0.0075 standard deviation 0.6837 minimum -5.1512 maximum 3.5556
The 1th iterated residual EWH (cm): Mean 0.0013 standard deviation 0.2514 minimum -2.8204 maximum 2.1486

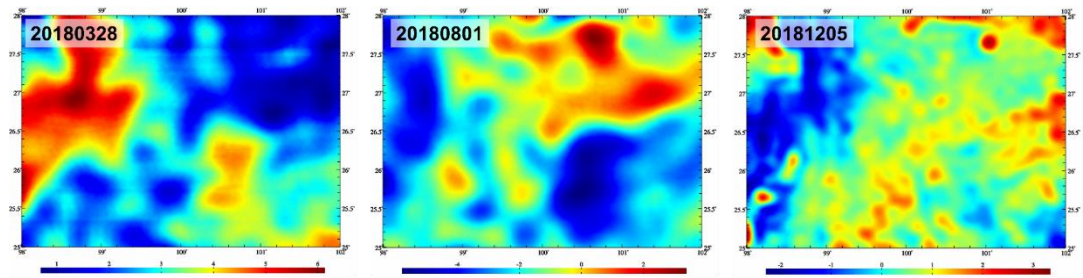
SRBF approach statistics of 20180328 load EWHs:
The source EWH observations (cm): Mean 6.8236 standard deviation 3.6424 minimum -13.1111 maximum 19.4132
The 0th iterated residual EWH (cm): Mean -0.0291 standard deviation 0.8465 minimum -7.3127 maximum 5.1767

using the setting parameters Just designed

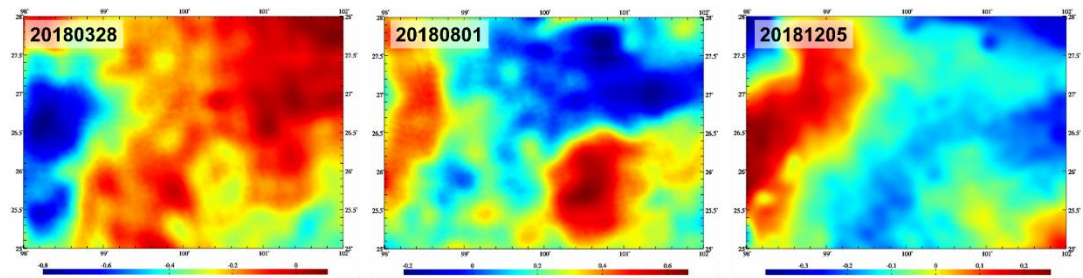
Extract the effects to be plot

geoid / height anomaly (mm) Ground gravity (μGal) radial displacement (mm) gravity gradient (mE)

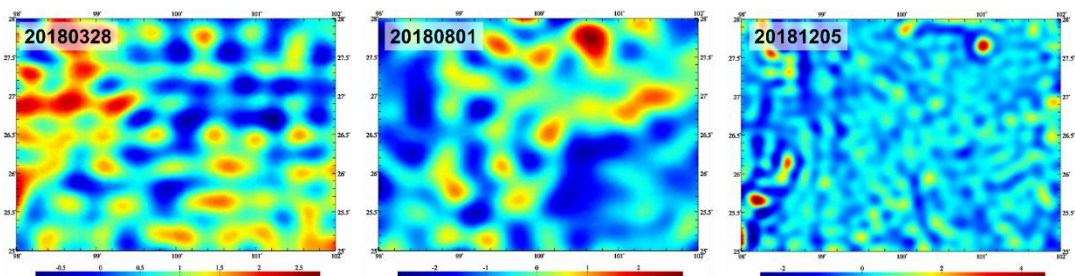
The effectiveness principle of the parameter optimization and cumulative approach: (1) The estimated load EWH and load effects in space is continuous and differentiable, and (2) the residual standard deviation of the estimated load EWHs is obviously reduced, and the residual statistical mean tends to zero.



Regional 1'x1' soil water residual load effect (μGal) grid time series on ground gravity



Regional 1'x1' soil water residual load effect (mm) grid time series on ground ellipsoidal height



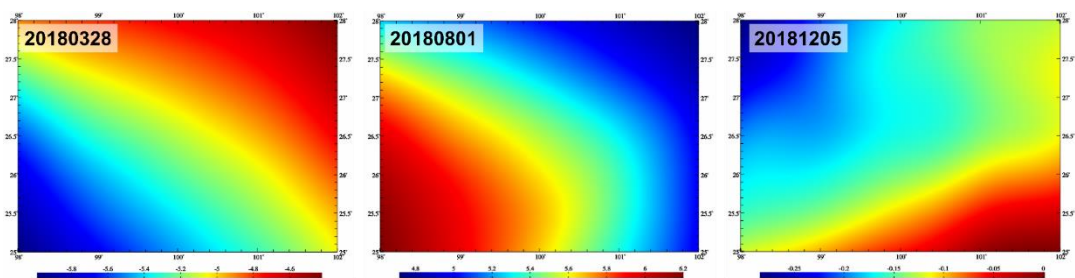
Regional 1'x1' soil water residual load effect (mE) grid time series on gravity gradient

Step 4: Calculate and restore the soil water load effect model value grid time series and generate the regional high-resolution soil water load effect full-element grid time series.

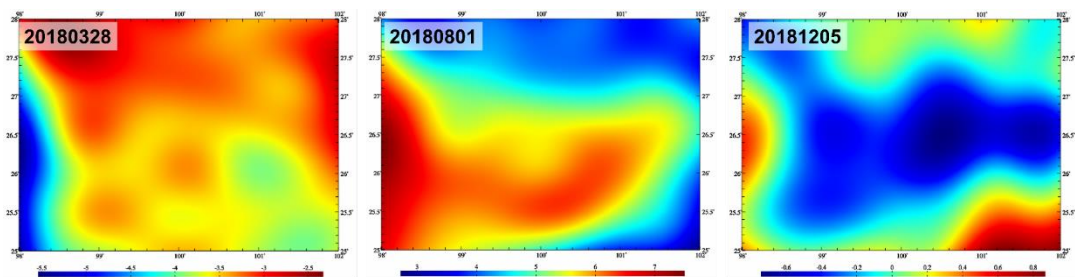
Call the function [Computation of load effect time series by spherical harmonic synthesis], input the calculation result area 1'x1' zero-value grid file zero1mrst, let 'land water EWH (cm)' as the surface load type and the maximum calculation degree is 360, calculate the global reference model value grid time series loadfmdl***.??? of soil water load effects from the global soil water load spherical harmonic coefficient model time series Indwater*cs.dat.

Call the function [Weighted operations on two groups of grid time series], directly add the reference model value grid time series loadfmdl***.??? to the residual grid time series rntSRBFs***.??? of soil water load effects to generate the regional 1'x1' full-element grid time series soilloadfmdl***.??? of soil water load effects.

Where ??? = ksi, gra, rga, dft, vdf, dph, dpr, nmh, grr or hgd, respectively, representing the grid file of the soil water load effects on the height anomaly, ground gravity, gravity disturbance, ground tilt, vertical deflection, horizontal displacement, radial displacement, normal or orthometric height, disturbing gravity gradient or horizontal gravity gradient.



Regional 1'x1' soil water load effect model value (mm) grid time series on geoid



Regional 1'x1' soil water load effect model value (µGal) grid time series on ground gravity

*** are the wildcards of the variation grid time series file names, whose instance can identify the sampling epoch time of the load effects.

Step 4: Calculate and restore the soil water load effect model value grid time series, and generate the regional high-resolution soil water load effect full-element grid time series

Computation of various load effects by spherical harmonic synthesis | Computation of various load effects of Earth satellite or outside solid Earth | **Computation of load effect time series by spherical harmonic synthesis** | Algorithm formulas

Select the calculation point file format: The calculation surface height grid file

The type of surface load: Land water EWH

Open the land surface height grid file

Open any load harmonic coefficient model file

Set the wildcard of the file names

Ordinal number of first wildcard in file name: 9

Number of consecutive wildcards in file name: 8

Select the type of effects:

- geoid or height anomaly (mm)
- ground gravity (μGal)
- gravity disturbance (μGal)
- ground tilt (SW, mas)
- vertical deflection (SW, mas)
- horizontal displacement (EN, mm)
- ground radial displacement (mm)
- ground normal or orthometric height (mm)
- disturbing gravity gradient (radial, $10\mu\text{E}$)
- horizontal gravity gradient (NW, $10\mu\text{E}$)

Maximum truncated degree of the coefficient model: 360

Set the result folder | Import setting parameters | Start computation

*** The program outputs the surface load effect grid time series files loadmdl***.???, where ??? = kai, gra, rga, dft, vdf, dph, dpr, nmh, grr or hgd, respectively, representing the grid file of load effects on the height anomaly, ground gravity, gravity disturbance, ground tilt, vertical deflection, horizontal displacement, radial displacement, normal or orthometric height, disturbing gravity gradient or horizontal gravity gradient.

Here, *** are the wildcards of the model time series file name, whose instance can identify the sampling epoch time of the computed load effects. The number of output files is equal to the number of the time series files of the load spherical harmonic coefficient model.

** The load harmonic coefficient model files searched by wildcard instantiation:

```
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20180131.s.dat
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20180328.s.dat
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20180530.s.dat
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20180801.s.dat
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20181003.s.dat
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/sphsmodel/ndwater/20181205.s.dat
```

>> Setting parameters have been imported in the program!

** Click the control button [Start computation], or the tool button [Start computation]...

** The computation process needs to wait. During the computation period, you can open the output files folder C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl to look at the computation progress!

** The last column attribute of each output file header is the instance of the wildcards of the file name of the model time series, which represents the sampling epoch time of the output file.

Extract deformation field to be plot: Plot

Weighted operations on two groups of (vector) grid time series

Open the | Save as | Import parameters | Save process | Follow example

Weighted operations on two record time series with same specifications | Construction of record time series from batch discrete point files | **Weighted operations on two groups of grid time series** | Weighted operations on two groups of vector grid time series

Open any grid time series file of the group 1

Set the wildcard of the file names

Ordinal number of the first wildcard in the file name: 9

Number of consecutive wildcards in the file name: 8

Open any grid time series file of the group 2

Set the wildcard of the file names

Ordinal number of the first wildcard in the file name: 9

Number of consecutive wildcards in the file name: 8

Select operation mode: Plus +

The first weight: 1.00 | The second weight: 1.00

>> Program Process ** Operation Prompts

>> Create or select the results folder C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/kai.

** The grid time series files of the group 1 searched by wildcard instantiation:

```
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20180131.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20180328.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20180530.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20180801.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20181003.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/loadfmd/20181205.kai
```

** The grid time series files of the group 2 searched by wildcard instantiation:

```
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20180131.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20180328.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20180530.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20180801.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20181003.kai
C:/ETideLoad4_5_win64en/examples/Loadmfcdalcdemo/rstmdl/mntSRBF/20181205.kai
```

>> Setting parameters have been imported in the program!

** Click the control button [Start computation], or the tool button [Start computation]...

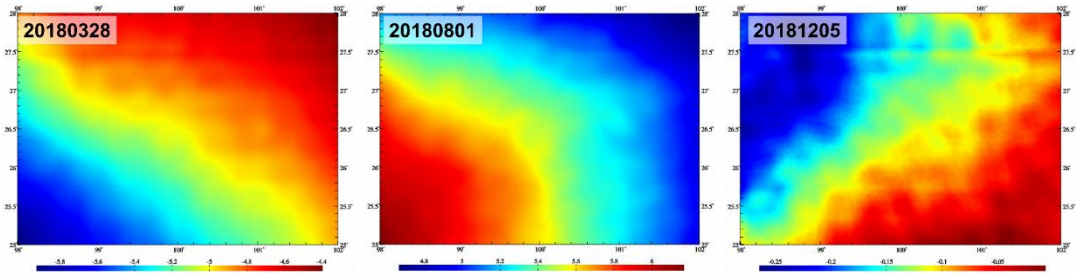
>> Computation start time: 2023-05-17 16:50:16

>> Complete the weighted operations of two groups of grid time series files! There are 6 pairs of grid time series files operated.

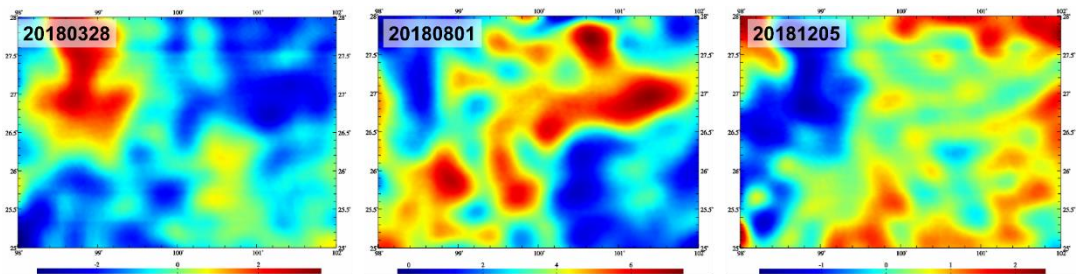
>> Computation end time: 2023-05-17 16:50:16

Set the results fold | Import setting parameters | Start computation

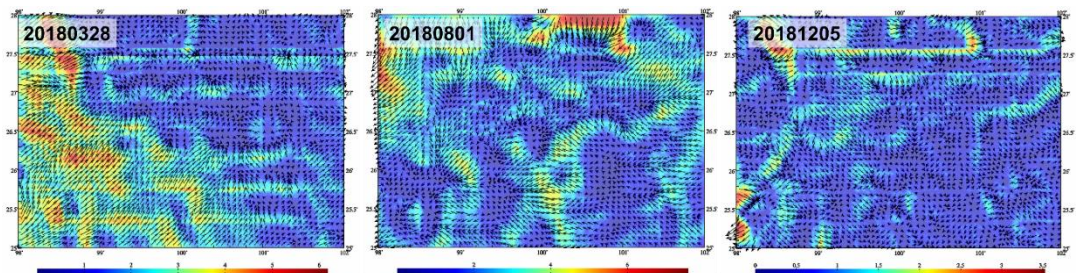
According to the same processes above, you can compute regional atmosphere or sea level variation load deformation field full-element grid time series.



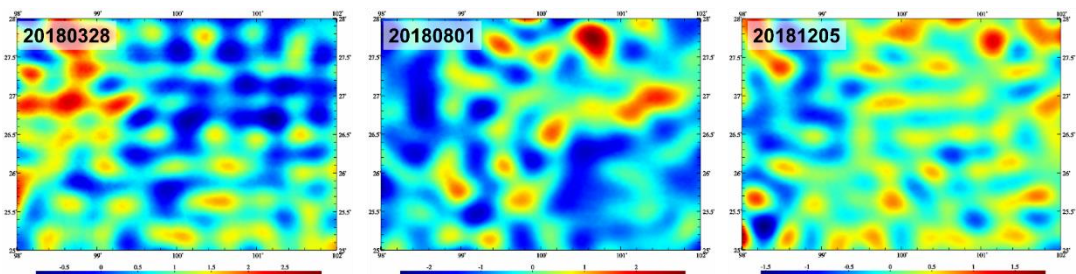
Regional 1'x1' soil water load effect (mm) grid time series results on geoid



Regional 1'x1' soil water load effect (μGal) grid time series results on ground gravity



Regional 1'x1' soil water load effect (mas) vector grid time series results on ground tilt



Regional 1'x1' soil water load effect (mE) grid time series results on gravity gradient

ETideLoad4.5's algorithm of the load approach and load effect synthesis using SRBFs can effectively solve the problems of high-degree oscillation and poor convergence of Green's function and the spectrum leakage and singularity of Green's integral in the near area around the calculation point.

The full-element load deformation field approached can be used to accurately calibrate

the key payloads of geodetic satellite, verify the satellite geodetic monitoring ability, and effectively improve the monitoring performance, reliability, and accuracy level.

The regional load deformation field approached can be used for the epoch reduction of various high-precision observations such as GNSS, leveling and gravity, which can support the realization and coordinated maintenance of heterogeneous geodetic datum.

It is the basic and lowest requirement of deep fusion of multi-source heterogeneous data and collaborative monitoring of multiple heterogeneous technologies in geodesy to use the surface load deformation field for the unification of monitoring epoch reduction and monitoring datum.