Own geodetic data files format in PALGrav4.0

The PALGrav4.0 programs use three forms of own geodetic data files which are geodetic point records file, geodetic grid file and vectors grid file.

1. Geodetic point records file

Geodetic point data is represented by a one-dimensional array.

Multiple lines of header files are allowed, and the content and format of header files are not restricted.

One record represents the geodetic data of one site. The attributes of each record include point number (name), longitude (degree decimal), latitude (degree decimal), attribute 4, …, attribute n.

The attribute convention is a numeric format, the maximum value of the attribute number n is 80, and the attributes are separated by spaces.

A record reading statement in Fortran language is “read(fileno,*)(record(i),i=1,n) ! real*8 record(n) ”.

rdgravpntmxdx. txt

1	1	102.392927	24.494402	2227.4900	25.8548	22.8415	2210.7385	22.9157
2	2	102.395920	24.508898	2169.5000	19.2278	23.3482	2220.1556	23.1268
3	3	102.392718	24.529614	2012.6300	-2.5982	23.5704	2112.7810	23.1433
4	4	102.396602	24.545253	2121.8000	8.5305	22.2493	2071.2506	22.4506
5	5	102.396873	24.563563	1970.5800	-7.6153	21.1752	2045.8186	20.8999
6	6	102.393754	24.581317	1939.6100	-9.4593	19.2625	1962.1555	19.1874
7	7	102.395223	24.603553	1964.8800	-7.7358	16.3706	1985.6935	16.3132
8	8	102.393104	24.617811	1997.0200	-5.1529	14.5630	1978.1810	14.6096
9	9	102.393520	24.638369	1915.4500	-11.6028	12.4719	1947.9042	12.4048
10	10	102.397107	24.653500	2009.9700	-0.2375	10.8712	1974.4709	10.9325
11	11	102.396963	24.675343	1945.3300	-7.3841	9.6422	1981.4985	9.5877
12	12	102.395819	24.692939	1980.3300	-3.7480	9.0670	1966.7684	9.0868
13	13	102.395371	24.708913	2029.0300	2.5687	8.8403	1957.6558	8.9453
14	14	102.395350	24.727566	1902.2900	-12.2454	9.0661	1903.0214	9.0650
15	15	102.396700	24.745993	1869.7500	-15.8731	8.9810	1891.7180	8.9468
16	16	102.395841	24.764933	2083.6400	7.3406	8.5926	2073.5757	8.6092
17	17	102.393966	24.781787	2268.9800	26.9402	8.1585	2196.5105	8.2855
18	18	102.394006	24.801727	1938.9900	-7.5474	7.5344	2020.5270	7.3956
19	19	102.398417	24.817405	1904.2900	-10.6788	4.8800	1984.9395	4.7832
20	20	102.396456	24.874484	1880.3900	-11.4857	-2.6543	1930.2448	-2.6614

2. Geodetic grid file

The geodetic grid data is represented by a two-dimensional array.

There is a header file at the beginning of the file. The format of the header file is: minimum longitude, maximum longitude, minimum latitude, maximum latitude, grid longitude interval, latitude interval. The units are all decimal degrees.

The grid elements are sequentially stored in an increasing manner of row latitude and column longitude until all data is stored. The elements are separated by spaces.

The Fortran reading program for the entire grid data of the geodetic grid file:

```
open(unit=fileno,file=filename,status="old")
read(fileno,*)(hd(i),i=1,6)     !real*8 hd(6) is the file header
nlon=nint((hd(2)-hd(1))/hd(5))  !integer*4 nlon is the column number of grid
nlat=nint((hd(4)-hd(3))/hd(6))  !integer*4 nlat is the column number of grid
!real*8 gr(nlat,nlon) is the array to store grid data
do i=1,nlat
   read(fileno,*)(gr(i,j),j=1,nlon)
enddo
```

```
close(fileno)
```

dbmhgt150s.dat

1	104.000000	114.000000	25.000000	34.000000	0.04166667	0.04166667	
2	1880.6233	1872.6612	1910.7203	1931.7653	1992.7665	1897.7199
3	1579.5158	1478.5360	1457.5736	1610.5877	1703.5435	1392.4407
4	1127.0862	1141.1257	1156.1979	1181.3065	1335.4466	1400.5901
5	530.3264	562.3283	484.3702	478.4546	553.5518	717.6379
6	642.5849	575.7052	629.8202	654.9330	694.0609	807.1985
7	726.9670	439.0212	598.0862	604.1542	596.2404	510.3528
8	820.4032	667.4105	588.4110	585.4184	661.4350	557.4490
9	494.4559	433.5850	353.7288	430.9312	723.1754	821.3956
10	128.9223	219.0560	175.1799	152.2779	137.3618	113.4669
11	456.2471	331.3871	360.5383	451.7036	575.8641	698.9905
12	151.7805	150.9271	208.1027	343.2925	296.4793	343.6893
13	220.4542	560.7228	752.9326	548.0788	375.1834	295.2821
14	267.7073	300.9139	596.1386	576.3569	569.5556	559.7308
15	466.1608	254.1723	224.2118	236.2868	250.4018	331.5582
16	509.1123	504.2678	607.4595	873.6999	972.9491	777.1609
17	129.8216	112.8806	145.9967	223.1369	239.2738	219.4003
18	1868.6248	1859.6737	1903.7419	2051.7911	2088.7992	1910.7605
19	1475.5124	1382.5200	1476.5441	1626.5437	1580.4903	1318.3843
20	1155.2158	1193.2735	1209.3569	1255.4640	1365.5851	1386.7009
21	603.2370	489.2430	499.3152	525.4287	630.5491	820.6481
22	436.4368	493.5515	611.6602	584.7656	649.9001	678.0571
23	810.9687	592.0663	740.1506	699.2175	528.2842	489.3798
24	846.3914	704.4151	612.4340	629.4463	664.4447	527.4279
25	535.4974	512.6069	399.7202	349.8989	588.1524	826.4035
26	125.9356	220.0765	320.2098	353.3070	186.3731	112.4551
27	676.2454	407.3790	323.5069	448.6483	528.7928	597.9153
28	136.6771	139.8328	197.0123	328.2091	277.4131	357.6508

3. Vectors grid file

A vectors grid are composed of the first components grid and the second components grid of the vector. The header file and the first components grid in the vectors grid file are same as that in the geodetic grid file, and the second components grid follow the first components grid closely with the same way.

Vectors Grids such as vertical deviation and horizontal gradient vectors in PALGrav4.0 are stored in the form of vectors grid file.