

Supplementary material

**Estimation of the climate feedback parameter by using
radiative fluxes from CERES EBAF**

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Details on downloading CERES TOA radiation data and calculating anomalies

by Pehr Björnbom

This report describes downloading and reading TOA radiation data from NASA's [CERES EBAF product](#) and how anomalies were calculated from such data.

Downloading data from the CERES EBAF product

The data may be downloaded via the following link:
<http://ceres-tool.larc.nasa.gov/ord-tool/jsp/EBAFSelection.jsp>

Data for monthly global means for the full CERES measuring period were downloaded and delivered with the following file name:

CERES_EBAF-TOA_Ed2.6r_Subset_200003-201112.nc

The file format of this file is [NetCDF](#). Special software is needed in order to convert the file content to text format for further processing.

Reading the downloaded NetCDF file

Software for Windows was downloaded from
<http://www.unidata.ucar.edu/software/netcdf/docs/netcdf-install/Prebuilt-DLL.html#Prebuilt-DLL>

The program for reading NetCDF files within that software is `ncdump.exe`. See the following link for usage of that program:

<http://www.unidata.ucar.edu/software/netcdf/docs/ncdump-man-1.html>

The files were placed in a subdirectory named `netcdf`. To the same directory a copy of the NetCDF file `CERES_EBAF-TOA_Ed2.6r_Subset_200003-201112.nc` was placed with the name changed to `In.nc`.

A cmd file `Batch.cmd` (batch execution in Windows 7) was finally prepared in the same subdirectory and executed in order to read the NetCDF file using the program `ncdump.exe`. It contained the following commands:

```
ncdump In.nc  
pause
```

Results from executing ncdump

```
C:\Users\Pehr\Documents\Klimatfrågan\Skriverier\Fasplansanalyser-fasforskjutning
\CERES-data\netcdf>ncdump In.nc
```

```
netcdf In {
dimensions:
    time = 142 ;
variables:
    int time(time) ;
        time:long_name = "time" ;
        time:units = "days since 2000-03-01 00:00:00" ;
        time:delta_t = "0000-00-01 00:00:00" ;
    float gtoa_sw_all_mon(time) ;
        gtoa_sw_all_mon:long_name = "Top of The Atmosphere Shortwave Flux, Monthly Means, All-Sky conditions" ;
        gtoa_sw_all_mon:standard_name = "TOA Shortwave Flux - All-Sky" ;

        gtoa_sw_all_mon:CF_name = "toa_outgoing_shortwave_flux" ;
        gtoa_sw_all_mon:IPCC_name = "none" ;
        gtoa_sw_all_mon:units = "W m-2" ;
        gtoa_sw_all_mon:valid_min = " 0.00000" ;
        gtoa_sw_all_mon:valid_max = " 600.000" ;
        gtoa_sw_all_mon:_FillValue = -999.f ;
    float gtoa_sw_clr_mon(time) ;
        gtoa_sw_clr_mon:long_name = "Top of The Atmosphere Shortwave Flux, Monthly Means, Clear-Sky conditions" ;
        gtoa_sw_clr_mon:standard_name = "TOA Shortwave Flux - Clear-Sky"
;
        gtoa_sw_clr_mon:CF_name = "toa_outgoing_shortwave_flux_assuming_clear_sky" ;
        gtoa_sw_clr_mon:IPCC_name = "none" ;
        gtoa_sw_clr_mon:units = "W m-2" ;
        gtoa_sw_clr_mon:valid_min = " 0.00000" ;
        gtoa_sw_clr_mon:valid_max = " 600.000" ;
        gtoa_sw_clr_mon:_FillValue = -999.f ;
    float gtoa_lw_all_mon(time) ;
        gtoa_lw_all_mon:long_name = "Top of The Atmosphere Longwave Flux, Monthly Means, All-Sky conditions" ;
        gtoa_lw_all_mon:standard_name = "TOA Longwave Flux - All-Sky" ;
        gtoa_lw_all_mon:CF_name = "toa_outgoing_longwave_flux" ;
        gtoa_lw_all_mon:IPCC_name = "none" ;
        gtoa_lw_all_mon:units = "W m-2" ;
        gtoa_lw_all_mon:valid_min = " 0.00000" ;
        gtoa_lw_all_mon:valid_max = " 400.000" ;
        gtoa_lw_all_mon:_FillValue = -999.f ;
    float gtoa_lw_clr_mon(time) ;
        gtoa_lw_clr_mon:long_name = "Top of The Atmosphere Longwave Flux, Monthly Means, Clear-Sky conditions" ;
        gtoa_lw_clr_mon:standard_name = "TOA Longwave Flux - Clear-Sky"
;
;
```

```

    gtoa_lw_clr_mon:CF_name = "toa_outgoing_longwave_flux_assuming_c
lear_sky" ;
    gtoa_lw_clr_mon:IPCC_name = "none" ;
    gtoa_lw_clr_mon:units = "W m-2" ;
    gtoa_lw_clr_mon:valid_min = " 0.00000" ;
    gtoa_lw_clr_mon:valid_max = " 400.000" ;
    gtoa_lw_clr_mon:_FillValue = -999.f ;
    float gtoa_net_all_mon(time) ;
    gtoa_net_all_mon:long_name = "Top of The Atmosphere Net Flux, Mo
nthly Means, All-Sky conditions" ;
    gtoa_net_all_mon:standard_name = "TOA Net Flux - All-Sky" ;
    gtoa_net_all_mon:CF_name = "toa_net_downward_flux" ;
    gtoa_net_all_mon:IPCC_name = "none" ;
    gtoa_net_all_mon:units = "W m-2" ;
    gtoa_net_all_mon:valid_min = " -400.000" ;
    gtoa_net_all_mon:valid_max = " 400.000" ;
    gtoa_net_all_mon:_FillValue = -999.f ;
    float gtoa_net_clr_mon(time) ;
    gtoa_net_clr_mon:long_name = "Top of The Atmosphere Net Flux, Mo
nthly Means, Clear-Sky conditions" ;
    gtoa_net_clr_mon:standard_name = "TOA Net Flux - Clear-Sky" ;
    gtoa_net_clr_mon:CF_name = "toa_net_downward_flux_assuming_clear
_sky" ;
    gtoa_net_clr_mon:IPCC_name = "none" ;
    gtoa_net_clr_mon:units = "W m-2" ;
    gtoa_net_clr_mon:valid_min = " -400.000" ;
    gtoa_net_clr_mon:valid_max = " 400.000" ;
    gtoa_net_clr_mon:_FillValue = -999.f ;

// global attributes:
    :title = "CERES EBAF (Energy Balanced and Filled) Fluxes. Monthl
y Averages and 12-year Climatology." ;
    :institution = "NASA/LaRC (Langley Research Center) Hampton, Va"
;
    :Conventions = "CF-1.4" ;
    :comment = "Data is from East to West and South to North. Climat
ology from 03/2000 to 12/2011." ;
    :version = "This is version 2.6r: May 21, 2012" ;
    :Fill_Value = "Fill Value is -999.0" ;
data:
time = 14, 45, 75, 106, 136, 167, 198, 228, 259, 289, 320, 351, 379, 410,
440, 471, 501, 532, 563, 593, 624, 654, 685, 716, 744, 775, 805, 836,
866, 897, 928, 958, 989, 1019, 1050, 1081, 1109, 1140, 1170, 1201, 1231,
1262, 1293, 1323, 1354, 1384, 1415, 1446, 1475, 1506, 1536, 1567, 1597,
1628, 1659, 1689, 1720, 1750, 1781, 1812, 1840, 1871, 1901, 1932, 1962,
1993, 2024, 2054, 2085, 2115, 2146, 2177, 2205, 2236, 2266, 2297, 2327,
2358, 2389, 2419, 2450, 2480, 2511, 2542, 2570, 2601, 2631, 2662, 2692,
2723, 2754, 2784, 2815, 2845, 2876, 2907, 2936, 2967, 2997, 3028, 3058,
3089, 3120, 3150, 3181, 3211, 3242, 3273, 3301, 3332, 3362, 3393, 3423,

```

3454, 3485, 3515, 3546, 3576, 3607, 3638, 3666, 3697, 3727, 3758, 3788,
3819, 3850, 3880, 3911, 3941, 3972, 4003, 4031, 4062, 4092, 4123, 4153,
4184, 4215, 4245, 4276, 4306 ;

gtoa_sw_all_mon = 99.4957, 97.8712, 97.8626, 96.5942, 93.7412, 92.983,
95.5235, 101.9543, 106.8059, 108.4812, 105.1624, 103.0262, 99.4299,
98.5809, 98.0307, 96.4214, 93.6435, 93.0778, 94.8598, 101.6542, 106.0539,
109.2576, 106.8578, 102.8322, 99.5136, 98.0119, 96.9475, 96.8675, 94.667,
93.7958, 94.9153, 99.8758, 106.4267, 108.5529, 106.238, 101.9976, 98.906,
97.773, 98.1603, 96.245, 93.64, 92.1803, 94.5476, 99.8009, 105.7974,
107.848, 106.0226, 101.592, 100.4369, 96.8504, 98.836, 97.2232, 93.4566,
92.594, 94.4582, 100.4045, 105.8991, 107.5815, 105.9673, 102.6065,
99.3555, 97.6581, 97.301, 96.7755, 94.4297, 93.2126, 94.6833, 100.4002,
105.9188, 107.0923, 106.3266, 102.3904, 99.5119, 97.6568, 97.2135,
95.8308, 93.9269, 92.8741, 94.425, 101.0653, 105.3626, 108.1433,
106.3205, 101.9106, 99.5098, 97.004, 97.7475, 96.4223, 93.8298, 93.0174,
95.1741, 99.9647, 106.3675, 109.1313, 106.9142, 102.7171, 98.4783,
97.6023, 96.9059, 96.1598, 93.3471, 92.2237, 95.6182, 100.0246, 106.5221,
107.4167, 106.0346, 102.1131, 99.4899, 97.2491, 97.0435, 95.7596,
94.1021, 92.4195, 95.5381, 100.4883, 106.7249, 108.2765, 106.7873,
102.8881, 99.69, 97.5132, 97.9597, 96.9735, 94.7943, 93.3368, 95.121,
100.7647, 106.5819, 108.5021, 106.5316, 102.5684, 99.0557, 97.5536,
97.904, 97.3643, 94.0163, 92.468, 94.475, 99.7011, 106.3996, 109.6735 ;

gtoa_sw_clr_mon = 53.5735, 54.5083, 54.7605, 51.8083, 49.3646, 48.2479,
49.5276, 52.4575, 55.428, 55.3135, 53.8978, 53.6567, 53.7084, 55.0078,
54.3896, 52.8024, 49.3326, 48.2727, 49.0732, 51.8437, 54.746, 55.0724,
53.4787, 52.534, 53.1824, 54.4656, 54.662, 51.673, 49.5831, 48.1531,
48.6828, 51.7607, 54.8322, 55.4007, 53.621, 53.2325, 53.71, 54.3354,
54.866, 51.5196, 49.3247, 47.7277, 48.6097, 51.4131, 54.7832, 55.0854,
53.7594, 52.9857, 53.738, 54.1201, 55.0184, 52.1823, 49.4282, 47.8501,
48.8949, 52.1222, 54.748, 54.5603, 53.8847, 53.2857, 53.4133, 54.3162,
54.0317, 51.618, 49.3519, 47.9673, 48.9748, 51.667, 54.8822, 54.4853,
54.2429, 53.1061, 53.5622, 54.2002, 53.8817, 51.3799, 49.4217, 48.1894,
48.8576, 52.0025, 54.9013, 55.4456, 53.8756, 52.8803, 53.4771, 53.7241,
54.3087, 51.3068, 48.9288, 47.7436, 48.9863, 51.9219, 55.0249, 55.9136,
54.4063, 53.4519, 53.0972, 54.7026, 54.4838, 51.7219, 49.4109, 47.8123,
49.1581, 52.0216, 55.1974, 55.2996, 53.9721, 53.0358, 53.7369, 54.4474,
54.8204, 51.9302, 49.6891, 48.2063, 49.1402, 52.0408, 55.1401, 55.0245,
54.0828, 53.2249, 53.8371, 53.8431, 53.7017, 51.158, 49.4423, 48.1298,
48.7741, 51.7196, 55.0247, 55.2934, 53.762, 53.4607, 53.9625, 54.0278,
54.0898, 51.7198, 49.711, 47.9032, 49.1289, 51.9592, 55.1965, 55.4054 ;

gtoa_lw_all_mon = 237.6922, 237.7768, 240.3952, 242.6232, 243.2393,
243.2106, 241.7657, 238.3385, 236.4409, 236.2677, 236.4285, 236.5194,
236.9845, 237.9547, 240.4843, 241.8034, 243.5838, 244.1496, 241.7139,
239.2572, 237.5969, 236.2559, 236.4692, 237.4566, 237.631, 238.9108,
241.2273, 242.6985, 244.2733, 243.9228, 242.6431, 239.5291, 237.0026,
236.5201, 237.478, 237.7984, 238.5529, 238.6237, 240.6662, 242.6628,
244.0551, 243.5967, 242.1919, 240.237, 237.5489, 237.1757, 236.4994,

237.7934, 237.8128, 238.7042, 240.1918, 242.8952, 243.2787, 243.5583,
 242.1264, 240.0165, 237.2286, 236.0505, 236.9907, 237.5464, 237.9671,
 238.7949, 239.6929, 242.5632, 244.0548, 243.5663, 242.0729, 240.0334,
 237.6579, 236.697, 236.2253, 237.0245, 237.597, 237.952, 239.8078,
 243.0601, 244.1143, 243.8424, 242.2745, 239.4431, 237.3798, 236.4005,
 237.7636, 237.6281, 238.4271, 238.8623, 240.69, 242.0152, 243.9459,
 243.6513, 242.4613, 239.907, 237.2989, 236.4429, 235.6654, 237.0806,
 237.6923, 238.3107, 240.1803, 242.1925, 243.6686, 242.7697, 241.3338,
 239.0822, 237.0524, 236.0853, 236.1861, 236.5728, 236.5176, 238.4864,
 240.1828, 241.4951, 243.5302, 243.8477, 241.7795, 239.6758, 237.2965,
 235.9605, 237.6315, 237.5139, 238.3483, 238.2004, 240.6319, 242.322,
 243.4101, 243.9028, 242.1152, 239.4863, 237.6028, 236.2248, 235.902,
 237.5609, 237.8914, 238.2095, 239.3347, 242.019, 243.9966, 244.0931,
 242.964, 239.062, 236.8557, 236.0385 ;

gtoa_lw_clr_mon = 263.6458, 265.1878, 267.3186, 269.4572, 269.5587,
 269.2263, 267.5652, 265.224, 263.4343, 262.8181, 262.2567, 262.5204,
 263.1552, 265.3564, 268.019, 269.1001, 269.9644, 269.7666, 267.3551,
 265.6635, 264.1984, 262.5647, 263.0638, 263.5071, 263.6728, 265.6128,
 268.288, 270.1956, 270.5566, 269.6076, 268.1438, 265.2131, 263.4789,
 262.4669, 263.0696, 263.1104, 263.8002, 265.4367, 268.0215, 269.4172,
 270.052, 269.3542, 268.0734, 266.3228, 263.3704, 263.0758, 262.2438,
 263.4444, 263.8651, 265.3285, 267.5878, 269.8903, 269.6971, 269.5479,
 267.6703, 265.7128, 263.8252, 262.6619, 262.9649, 263.3448, 264.0434,
 266.1931, 267.5793, 269.7602, 270.6611, 269.5681, 267.8639, 265.9443,
 264.0748, 262.91, 262.5308, 262.6992, 263.7278, 265.119, 267.4406,
 269.8113, 270.493, 269.472, 267.7525, 265.4997, 263.563, 262.9718,
 263.5625, 263.2505, 264.0973, 265.7177, 267.7091, 269.3107, 270.0904,
 269.4079, 267.8977, 265.6844, 263.6172, 262.6706, 261.3241, 262.2459,
 263.2001, 264.9221, 266.8472, 268.8977, 270.0211, 268.4328, 267.0468,
 265.0461, 263.2777, 262.2185, 262.4845, 261.9895, 262.6494, 264.9763,
 267.186, 268.6941, 269.8404, 268.9641, 267.2532, 265.2408, 263.3628,
 262.262, 263.1317, 262.9361, 264.0716, 265.0634, 267.6757, 268.7726,
 269.3524, 268.8553, 267.3346, 265.2298, 263.3999, 261.983, 261.5606,
 262.3327, 262.7835, 264.7195, 266.7223, 268.8696, 269.9094, 268.9133,
 267.4262, 264.819, 262.8634, 262.0168 ;

gtoa_net_all_mon = 6.8504, 2.0209, -5.8711, -9.8366, -7.8927, -4.4271,
 -0.2443, 2.1779, 4.1697, 5.9388, 9.3811, 8.8732, 7.7015, 1.1162, -6.041,
 -8.8415, -8.0887, -5.6076, 0.3646, 1.4299, 3.6336, 5.1097, 7.7345,
 8.2107, 7.1727, 0.836, -5.652, -10.0821, -9.9477, -6.1806, -0.6099,
 2.8011, 3.7681, 5.5128, 7.2107, 8.6075, 6.6768, 1.3154, -6.3774, -9.578,
 -8.7151, -4.2685, 0.132, 1.8459, 3.7351, 5.4034, 8.2396, 8.8185, 5.7231,
 1.9882, -6.7396, -10.8717, -7.8566, -4.661, 0.3684, 1.7808, 4.0427,
 6.8094, 7.6761, 7.9635, 6.6327, 1.0628, -4.7285, -10.1145, -9.5712,
 -5.2878, 0.0723, 1.6886, 3.4921, 6.5398, 8.1217, 8.7165, 6.873, 1.9482,
 -4.6656, -9.6269, -9.1523, -5.3378, 0.0597, 1.5122, 4.2337, 5.7196,
 6.5575, 8.5896, 6.0852, 1.7246, -6.1084, -9.1948, -8.9262, -5.3269,
 -0.9673, 2.0758, 3.2963, 4.6967, 8.0999, 8.2991, 7.68, 1.5065, -4.8934,
 -9.1854, -8.1638, -3.5698, -0.1426, 2.9544, 3.4841, 6.8003, 8.4032,

9.375, 7.8937, 1.7223, -4.9772, -8.053, -8.7592, -4.8526, -0.54, 1.8553,
 2.9991, 6.0342, 6.2264, 7.7481, 5.9761, 1.8926, -6.2429, -10.0254,
 -9.2785, -5.8043, -0.4526, 1.765, 2.8482, 5.5769, 8.2511, 8.06, 7.1288,
 1.9763, -4.7685, -10.0197, -9.0749, -5.146, -0.694, 3.2987, 3.8715, 4.7449 ;

gtoa_net_clr_mon = 26.8193, 17.9729, 10.3088, 8.1161, 10.1648, 14.292,
 19.9521, 24.7904, 28.5551, 32.5572, 34.8177, 32.2425, 27.2524, 17.2876,
 10.0667, 7.4814, 9.8422, 13.5804, 20.5116, 24.8352, 28.3395, 32.9863,
 34.5188, 32.4587, 27.4613, 17.6804, 9.5735, 7.6155, 8.8537, 13.7781,
 20.1236, 25.2342, 28.8871, 32.719, 34.2364, 32.0609, 26.625, 17.9406,
 9.563, 8.3936, 9.6036, 14.426, 20.1877, 24.1498, 28.9291, 32.266,
 34.7574, 31.7743, 26.3704, 18.0954, 9.6836, 7.176, 9.7533, 14.0933,
 20.3876, 24.3688, 28.5971, 33.22, 33.7834, 31.4857, 26.4978, 17.0066,
 10.6557, 7.845, 8.8998, 13.9556, 19.9899, 24.5122, 28.1126, 32.9334,
 33.8997, 32.3266, 26.6907, 18.2371, 11.0353, 8.0733, 8.9738, 13.7186,
 20.1501, 24.5203, 28.5122, 31.8464, 33.2034, 31.9972, 26.4467, 18.1489,
 10.3129, 8.6254, 9.8302, 14.1896, 19.785, 24.3428, 28.3207, 31.6878,
 34.9493, 32.3995, 27.5539, 17.7955, 10.8624, 8.5473, 9.4186, 15.1778,
 20.6041, 24.9949, 28.5839, 32.7843, 34.1669, 33.0368, 27.5158, 18.0344,
 10.2442, 8.5782, 9.343, 14.2438, 20.3846, 24.7391, 28.5185, 32.9849,
 33.4301, 31.9901, 26.1051, 18.6995, 10.9719, 9.3396, 10.1302, 14.4487,
 20.674, 25.0669, 28.6081, 33.0276, 35.3635, 32.3951, 27.3297, 18.9929,
 11.6597, 8.7738, 9.3171, 14.5982, 20.1899, 25.2854, 29.0675, 33.0361 ;
 }

C:\Users\Pehr\Documents\Klimatfrågan\Skriverier\Fasplansanalyser-fasförskjutning
 \CERES-data\netcdf>pause
 Tryck ned valfri tangent för att fortsätta...

Calculation of monthly anomalies

The values of `gtoa_net_all_mon` given above were used for calculation of monthly anomalies of the net TOA radiation. The corresponding values of the time variable indicate which month during the time period each value corresponds to. The anomalies were calculated by executing the following script in [Scilab](#):

```

0001  gtoa_net_all_mon = [6.8504, 2.0209, -5.8711, -9.8366, -7.8927, -4.4271,..
0002  -0.2443, 2.1779, 4.1697, 5.9388, 9.3811, 8.8732, 7.7015, 1.1162, -6.041,..
0003  -8.8415, -8.0887, -5.6076, 0.3646, 1.4299, 3.6336, 5.1097, 7.7345,..
0004  8.2107, 7.1727, 0.836, -5.652, -10.0821, -9.9477, -6.1806, -0.6099,..
0005  2.8011, 3.7681, 5.5128, 7.2107, 8.6075, 6.6768, 1.3154, -6.3774, -9.578,..
0006  -8.7151, -4.2685, 0.132, 1.8459, 3.7351, 5.4034, 8.2396, 8.8185, 5.7231,..
0007  1.9882, -6.7396, -10.8717, -7.8566, -4.661, 0.3684, 1.7808, 4.0427,..
0008  6.8094, 7.6761, 7.9635, 6.6327, 1.0628, -4.7285, -10.1145, -9.5712,..
0009  -5.2878, 0.0723, 1.6886, 3.4921, 6.5398, 8.1217, 8.7165, 6.873, 1.9482,..
0010  -4.6656, -9.6269, -9.1523, -5.3378, 0.0597, 1.5122, 4.2337, 5.7196,..
0011  6.5575, 8.5896, 6.0852, 1.7246, -6.1084, -9.1948, -8.9262, -5.3269,..
0012  -0.9673, 2.0758, 3.2963, 4.6967, 8.0999, 8.2991, 7.68, 1.5065, -4.8934,..
0013  -9.1854, -8.1638, -3.5698, -0.1426, 2.9544, 3.4841, 6.8003, 8.4032,..
0014  9.375, 7.8937, 1.7223, -4.9772, -8.053, -8.7592, -4.8526, -0.54, 1.8553,..
0015  2.9991, 6.0342, 6.2264, 7.7481, 5.9761, 1.8926, -6.2429, -10.0254,..
0016  -9.2785, -5.8043, -0.4526, 1.765, 2.8482, 5.5769, 8.2511, 8.06, 7.1288,..
0017  1.9763, -4.7685, -10.0197, -9.0749, -5.146, -0.694, 3.2987, 3.8715, 4.7449]'
0018
0019  time = [14, 45, 75, 106, 136, 167, 198, 228, 259, 289, 320, 351, 379, 410,..
0020  440, 471, 501, 532, 563, 593, 624, 654, 685, 716, 744, 775, 805, 836,..
0021  866, 897, 928, 958, 989, 1019, 1050, 1081, 1109, 1140, 1170, 1201, 1231,..
0022  1262, 1293, 1323, 1354, 1384, 1415, 1446, 1475, 1506, 1536, 1567, 1597,..
0023  1628, 1659, 1689, 1720, 1750, 1781, 1812, 1840, 1871, 1901, 1932, 1962,..
0024  1993, 2024, 2054, 2085, 2115, 2146, 2177, 2205, 2236, 2266, 2297, 2327,..
0025  2358, 2389, 2419, 2450, 2480, 2511, 2542, 2570, 2601, 2631, 2662, 2692,..
0026  2723, 2754, 2784, 2815, 2845, 2876, 2907, 2936, 2967, 2997, 3028, 3058,..
0027  3089, 3120, 3150, 3181, 3211, 3242, 3273, 3301, 3332, 3362, 3393, 3423,..
0028  3454, 3485, 3515, 3546, 3576, 3607, 3638, 3666, 3697, 3727, 3758, 3788,..
0029  3819, 3850, 3880, 3911, 3941, 3972, 4003, 4031, 4062, 4092, 4123, 4153,..
0030  4184, 4215, 4245, 4276, 4306]'
0031
0032  net=gtoa_net_all_mon
0033
0034  //The net radiation is defined as positive towards the ground.

0035  //In all the following diagrams negative values of the net radiation are
plotted in order to agree with the sign convention used by Spencer and Braswell (2010).

0036  plot(time,-net)
0037  xgrid
0038
0039  mon=1:142;mon=mon'
0040  scf(1)
0041  plot(mon,-net)
0042  xgrid
0043
0044  //Separating the monthly values for each of the eleven fulll years

0045  net1=net(11:22)
0046  net2=net(23:34)
0047  net3=net(35:46)
0048  net4=net(47:58)
0049  net5=net(59:70)
0050  net6=net(71:82)
0051  net7=net(83:94)
0052  net8=net(95:106)
0053  net9=net(107:118)
0054  net10=net(119:130)

```



```

0055     net11=net(131:142)
0056     mon1=(1:12)
0057     scf(2)
0058     xgrid
0059     plot(mon1,-net1,mon1,-net2,mon1,-net3,mon1,-net4,mon1,-net5,mon1,-net6,mon1,-
net7,mon1,-net8,mon1,-net9,mon1,-net10,mon1,-net11)
0060
0061     //Calculating the means of each month of the eleven full years (netm1 is a
vector with the twelve monthly means for the eleven year period)

0062     netm1=(net1+net2+net3+net4+net5+net6+net7+net8+net9+net10+net11)/11
0063     scf(3)
0064     plot(mon1,-netm1)
0065     xgrid
0066     scf(4)
0067     netm=[netm1(3:12); netm1; netm1; netm1; netm1; netm1; netm1; netm1; netm1;
netm1; netm1; netm1]
0068     plot(mon,-netm,mon,-net)
0069     xgrid
0070
0071     //Calculating the monthly anomalies (negative values are plotted in order to
agree with the sign convention used by Spencer and Braswell (2010))

0072     netan=net-netm
0073     scf(5)
0074     plot(mon,-netan)
0075     xgrid
0076
0077     //Calculating thirteen months central mean values of the monthly anomalies

0078     netan13m=[]
0079     mon13m=7:135;mon13m=mon13m'
0080     i=7
0081     while i<136
0082         netani=mean(netan(i-6:i+6))
0083         netan13m=[netan13m;netani]
0084         i=i+1
0085     end
0086     scf(6)
0087     plot(mon13m,-netan13m,mon,-netan)
0088     xgrid

```

Calculated anomaly values

scilab-5.3.3

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Startup execution:

loading initial environment

-->exec('C:\Users\Pehr\Documents\Scilabfiler\Klimatberäkningar\Fasplan\CERES EBAF.sce', -1)

-->netan

netan =

- 0.0172

0.4673455

- 0.3079636

- 0.2372364

0.9740455

0.6677091

- 0.0252636

0.0862909

0.5874727

0.2162818

1.5718455

0.3948636

0.8339

- 0.4373545

- 0.4778636

0.7578636

0.7780455
- 0.5127909
0.5836364
- 0.6617091
0.0513727
- 0.6128182
- 0.0747545
- 0.2676364
0.3051
- 0.7175545
- 0.0888636
- 0.4827364
- 1.0809545
- 1.0857909
- 0.3908636
0.7094909
0.1858727
- 0.2097182
- 0.5985545
0.1291636
- 0.1908
- 0.2381545
- 0.8142636
0.0213636
0.1516455
0.8263091
0.3510364
- 0.2457091
0.1528727
- 0.3191182
0.4303455
0.3401636
- 1.1445
0.4346455
- 1.1764636

- 1.2723364
1.0101455
0.4338091
0.5874364
- 0.3108091
0.4604727
1.0868818
- 0.1331545
- 0.5148364
- 0.2349
- 0.4907545
0.8346364
- 0.5151364
- 0.7044545
- 0.1929909
0.2913364
- 0.4030091
- 0.0901273
0.8172818
0.3124455
0.2381636
0.0054
0.3946455
0.8975364
- 0.0275364
- 0.2855545
- 0.2429909
0.2787364
- 0.5794091
0.6514727
- 0.0029182
- 1.2517545
0.1112636
- 0.7824
0.1710455

- 0.5452636
0.4045636
- 0.0594545
- 0.2320909
- 0.7482636
- 0.0158091
- 0.2859273
- 1.0258182
0.2906455
- 0.1792364
0.8124
- 0.0470545
0.6697364
0.4139636
0.7029455
1.5250091
0.0764364
0.8627909
- 0.0981273
1.0777818
0.5939455
0.8966636
1.0261
0.1687455
0.5859364
1.5463636
0.1075455
0.2422091
- 0.3209636
- 0.2363091
- 0.5831273
0.3116818
- 1.5828545
- 0.7302364
- 0.8915

0.3390455
- 0.6797636
- 0.4260364
- 0.4117545
- 0.7094909
- 0.2335636
- 0.3266091
- 0.7340273
- 0.1456182
0.4418455
- 0.4183364
0.2612
0.4227455
0.7946364
- 0.4203364
- 0.2081545
- 0.0511909
- 0.4749636
1.2070909
0.2892727
- 0.9776182

-->netan13m
netan13m =

0.4009301
0.3686105
0.2959021
0.3778888
0.4559874
0.3416154
0.3351483
0.2861909
0.2835049
0.1911748

0.1687874
0.0272888
0.0203839
- 0.0989587
- 0.0721517
- 0.0725266
- 0.2139741
- 0.3573462
- 0.3479671
- 0.3382860
- 0.2730874
- 0.2931713
- 0.2920741
- 0.2763881
- 0.2704776
- 0.3122664
- 0.3197056
- 0.3112266
- 0.2624280
- 0.1157154
- 0.0051902
0.0059755
- 0.0368413
- 0.0756867
- 0.0264510
0.0457580
- 0.0522161
- 0.0041049
- 0.0762825
- 0.1115189
- 0.0354587
- 0.0137538
- 0.0321287
- 0.0830399
- 0.0287182

0.0431287
0.0574336
- 0.0152727
- 0.0595084
- 0.0092203
0.0215483
0.0724196
0.1161028
0.0235538
0.0125944
- 0.0635937
- 0.0466182
- 0.0191713
- 0.0787434
- 0.0501804
- 0.0101622
0.0382643
0.1450559
0.0787350
0.0963951
0.1318923
0.1681790
0.1011986
0.1823126
0.1890210
0.0298643
0.0143888
- 0.0641161
- 0.0513741
- 0.1236748
- 0.1615958
- 0.1640510
- 0.1599385
- 0.1988056
- 0.2214629

- 0.1988874
- 0.3279098
- 0.3053280
- 0.2228266
- 0.1688930
- 0.1123280
- 0.0739671
- 0.0001804
0.0227720
0.1446538
0.1683867
0.2923140
0.2859818
0.3908825
0.5154797
0.5620965
0.6548147
0.6053028
0.6539944
0.7214273
0.6978566
0.6624154
0.5204175
0.4963601
0.3851357
0.4166594
0.2119951
0.1101350
- 0.0274161
- 0.0802664
- 0.1455364
- 0.2233804
- 0.3740049
- 0.4368538
- 0.4734517

- 0.4738860
- 0.5121720
- 0.4785175
- 0.4685049
- 0.3789266
- 0.3026622
- 0.2015664
- 0.1665210
- 0.1465650
- 0.1298049
- 0.1020692
- 0.0840287
0.0267909
0.0741664

Diagrams shown in the same order as plotted in the Scilab script file







