**Supporting Information**

Modelling and Simulating Biogeochemical Cycles: The BCS Freeware

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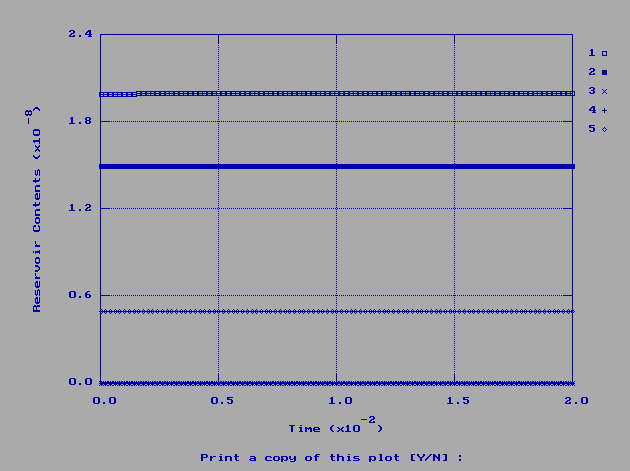
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1. **Raw Outputs**

The outputs shown here are related to item 3.2 *BCS Freeware Accuracy*.

**1.1 T-D**

The simulation results may be given in three different ways: (a) directly on the computer screen or (b) in a *.out* file (this kind of file may be read by any text editing software), and (c) in a plot also shown on the computer screen (Figure S1).



**Figure S1.** Plot generated by T-D.

The full content of the *.out* file is reproduced as follows.

*Reservoir Names:*

*1: Oxidized Sediments*

*2: Reduced Sediments*

*3: Soils*

*4: Atmosphere*

*5: Oceans*

*Initial Reservoir Vector:*

*2.000E+08 1.500E+08 3.062E+03 1.627E+00 5.000E+07*

*Rate Constant Matrix:*

*-2.665E-09 0.000E+00 0.000E+00 0.000E+00 1.067E-08*

*0.000E+00 -5.447E-09 0.000E+00 0.000E+00 1.634E-08*

*2.500E-09 5.000E-09 -8.167E-04 1.200E+00 0.000E+00*

*1.650E-10 4.470E-10 2.000E-04 -3.100E+00 4.800E-08*

*0.000E+00 0.000E+00 6.167E-04 1.900E+00 -7.501E-08*

*Eigenvalue Vector:*

*-3.100E+00 -7.393E-04 -3.142E-08 -3.697E-09 3.388E-21*

*Eigenvector Matrix:*

*2.109E-09 -1.443E-05 -3.710E-01 1.000E+00 1.000E+00*

*3.230E-09 -2.210E-05 -6.290E-01 -9.033E-01 7.493E-01*

*-3.872E-01 -9.999E-01 1.945E-05 -5.284E-06 1.499E-05*

*1.000E+00 -6.451E-05 1.663E-08 -1.916E-09 4.996E-09*

*-6.128E-01 1.000E+00 1.000E+00 -9.673E-02 2.498E-01*

*Normalization Coefficients:*

*6.230E-01 -6.236E+01 1.331E+04 -9.345E+04 2.001E+08*

*General Solution for Reservoir 1:*

*1.314E-09 exp (-3.100E+00 t) +*

*9.000E-04 exp (-7.393E-04 t) +*

*-4.938E+03 exp (-3.142E-08 t) +*

*-9.345E+04 exp (-3.697E-09 t) +*

*2.001E+08 exp ( 3.388E-21 t)*

*General Solution for Reservoir 2:*

*2.012E-09 exp (-3.100E+00 t) +*

*1.378E-03 exp (-7.393E-04 t) +*

*-8.372E+03 exp (-3.142E-08 t) +*

*8.441E+04 exp (-3.697E-09 t) +*

*1.499E+08 exp ( 3.388E-21 t)*

*General Solution for Reservoir 3:*

*-2.412E-01 exp (-3.100E+00 t) +*

*6.235E+01 exp (-7.393E-04 t) +*

*2.588E-01 exp (-3.142E-08 t) +*

*4.937E-01 exp (-3.697E-09 t) +*

*2.999E+03 exp ( 3.388E-21 t)*

*General Solution for Reservoir 4:*

*6.230E-01 exp (-3.100E+00 t) +*

*4.022E-03 exp (-7.393E-04 t) +*

*2.213E-04 exp (-3.142E-08 t) +*

*1.790E-04 exp (-3.697E-09 t) +*

*9.996E-01 exp ( 3.388E-21 t)*

*General Solution for Reservoir 5:*

*-3.818E-01 exp (-3.100E+00 t) +*

*-6.236E+01 exp (-7.393E-04 t) +*

*1.331E+04 exp (-3.142E-08 t) +*

*9.039E+03 exp (-3.697E-09 t) +*

*4.998E+07 exp ( 3.388E-21 t)*

*Reservoir Contents at Selected Times:*

*Time 1 2 3 4 5*

*0.0 2.000E+08 1.500E+08 3.062E+03 1.627E+00 5.000E+07*

*2.0 2.000E+08 1.500E+08 3.062E+03 1.005E+00 5.000E+07*

*4.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*6.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*8.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*10.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*12.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*14.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*16.0 2.000E+08 1.500E+08 3.062E+03 1.004E+00 5.000E+07*

*18.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*20.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*22.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*24.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*26.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*28.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*30.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*32.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*34.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*36.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*38.0 2.000E+08 1.500E+08 3.061E+03 1.004E+00 5.000E+07*

*40.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*42.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*44.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*46.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*48.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*50.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*52.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*54.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*56.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*58.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*60.0 2.000E+08 1.500E+08 3.060E+03 1.004E+00 5.000E+07*

*62.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*64.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*66.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*68.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*70.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*72.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*74.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*76.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*78.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*80.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*82.0 2.000E+08 1.500E+08 3.059E+03 1.004E+00 5.000E+07*

*84.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*86.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*88.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*90.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*92.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*94.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*96.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*98.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*100.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*102.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*104.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*106.0 2.000E+08 1.500E+08 3.058E+03 1.004E+00 5.000E+07*

*108.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*110.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*112.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*114.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*116.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*118.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*120.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*122.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*124.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*126.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*128.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*130.0 2.000E+08 1.500E+08 3.057E+03 1.004E+00 5.000E+07*

*132.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*134.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*136.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*138.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*140.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*142.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*144.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*146.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*148.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*150.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*152.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*154.0 2.000E+08 1.500E+08 3.056E+03 1.004E+00 5.000E+07*

*156.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*158.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*160.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*162.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*164.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*166.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*168.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*170.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*172.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*174.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*176.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*178.0 2.000E+08 1.500E+08 3.055E+03 1.004E+00 5.000E+07*

*180.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*182.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*184.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*186.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*188.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*190.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*192.0 2.000E+08 1.500E+08 3.054E+03 1.004E+00 5.000E+07*

*194.0 2.000E+08 1.500E+08 3.054E+03 1.003E+00 5.000E+07*

*196.0 2.000E+08 1.500E+08 3.054E+03 1.003E+00 5.000E+07*

*198.0 2.000E+08 1.500E+08 3.054E+03 1.003E+00 5.000E+07*

*200.0 2.000E+08 1.500E+08 3.054E+03 1.003E+00 5.000E+07*

*Infinite 2.001E+08 1.499E+08 2.999E+03 9.996E-01 4.998E+07*

*Change 9.839E+04 -7.604E+04 -6.286E+01 -6.274E-01 -2.229E+04*

**1.2 T-M**

The simulation results may be given in two different ways: (a) in a *.xls* file (this kind of file may be read by any spreadsheet software) and (b) in a series of plots shown on the computer screen. Those plots may be shown individually (each one in a single window) or in groups of four (the software creates a window containing the plots in reduced size arranged in a 2 × 2 matrix presentation). Figures S2a and S2b show the grouping of the plots. As the sulfur cycle has five reservoirs, two windows were created: the first one contains the plots related to the first four reservoirs and the second one with the fifth reservoir.

|  |
| --- |
|  |
|  |
|  |

**Figure S2.** Graphs generated by T-M: a) first four and b) fifth reservoirs.

The full content of the *.xls* file is reproduced as follows.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Sulfur Cycle: Results* | |  | |  | |
| *Time (a)* | *Oxidized Sediments* | *Reduced Sediments* | *Soils* | *Atmosphere* | *Oceans* |
| *0* | *200000013* | *149999768* | *3062* | *1.627* | *50000156* |
| *2* | *200000013* | *149999768* | *3062.149* | *1.005277* | *50000156* |
| *4* | *200000013* | *149999768* | *3062.057* | *1.00401* | *50000157* |
| *6* | *200000013* | *149999768* | *3061.966* | *1.004001* | *50000157* |
| *8* | *200000013* | *149999768* | *3061.874* | *1.003995* | *50000157* |
| *10* | *200000013* | *149999768* | *3061.783* | *1.003989* | *50000157* |
| *12* | *200000013* | *149999768* | *3061.692* | *1.003983* | *50000157* |
| *14* | *200000013* | *149999768* | *3061.6* | *1.003978* | *50000157* |
| *16* | *200000013* | *149999768* | *3061.509* | *1.003972* | *50000157* |
| *18* | *200000013* | *149999768* | *3061.419* | *1.003966* | *50000157* |
| *20* | *200000013* | *149999768* | *3061.328* | *1.00396* | *50000157* |
| *22* | *200000013* | *149999768* | *3061.237* | *1.003954* | *50000157* |
| *24* | *200000013* | *149999768* | *3061.147* | *1.003948* | *50000157* |
| *26* | *200000013* | *149999768* | *3061.056* | *1.003942* | *50000158* |
| *28* | *200000013* | *149999768* | *3060.966* | *1.003937* | *50000158* |
| *30* | *200000013* | *149999768* | *3060.876* | *1.003931* | *50000158* |
| *32* | *200000013* | *149999768* | *3060.786* | *1.003925* | *50000158* |
| *34* | *200000013* | *149999768* | *3060.696* | *1.003919* | *50000158* |
| *36* | *200000013* | *149999768* | *3060.607* | *1.003913* | *50000158* |
| *38* | *200000013* | *149999768* | *3060.517* | *1.003908* | *50000158* |
| *40* | *200000013* | *149999768* | *3060.428* | *1.003902* | *50000158* |
| *42* | *200000013* | *149999768* | *3060.339* | *1.003896* | *50000158* |
| *44* | *200000013* | *149999768* | *3060.249* | *1.00389* | *50000158* |
| *46* | *200000013* | *149999768* | *3060.16* | *1.003885* | *50000158* |
| *48* | *200000013* | *149999768* | *3060.072* | *1.003879* | *50000159* |
| *50* | *200000013* | *149999768* | *3059.983* | *1.003873* | *50000159* |
| *52* | *200000013* | *149999768* | *3059.894* | *1.003867* | *50000159* |
| *54* | *200000013* | *149999768* | *3059.806* | *1.003862* | *50000159* |
| *56* | *200000013* | *149999768* | *3059.717* | *1.003856* | *50000159* |
| *58* | *200000013* | *149999768* | *3059.629* | *1.00385* | *50000159* |
| *60* | *200000013* | *149999768* | *3059.541* | *1.003845* | *50000159* |
| *62* | *200000013* | *149999768* | *3059.453* | *1.003839* | *50000159* |
| *64* | *200000013* | *149999768* | *3059.365* | *1.003833* | *50000159* |
| *66* | *200000013* | *149999768* | *3059.278* | *1.003828* | *50000159* |
| *68* | *200000013* | *149999768* | *3059.19* | *1.003822* | *50000159* |
| *70* | *200000013* | *149999768* | *3059.103* | *1.003816* | *50000160* |
| *72* | *200000013* | *149999768* | *3059.015* | *1.003811* | *50000160* |
| *74* | *200000013* | *149999768* | *3058.928* | *1.003805* | *50000160* |
| *76* | *200000013* | *149999768* | *3058.841* | *1.0038* | *50000160* |
| *78* | *200000013* | *149999768* | *3058.754* | *1.003794* | *50000160* |
| *80* | *200000013* | *149999768* | *3058.667* | *1.003788* | *50000160* |
| *82* | *200000013* | *149999768* | *3058.581* | *1.003783* | *50000160* |
| *84* | *200000013* | *149999768* | *3058.494* | *1.003777* | *50000160* |
| *86* | *200000013* | *149999768* | *3058.408* | *1.003772* | *50000160* |
| *88* | *200000013* | *149999768* | *3058.321* | *1.003766* | *50000160* |
| *90* | *200000013* | *149999768* | *3058.235* | *1.00376* | *50000160* |
| *92* | *200000013* | *149999768* | *3058.149* | *1.003755* | *50000160* |
| *94* | *200000013* | *149999768* | *3058.063* | *1.003749* | *50000161* |
| *96* | *200000013* | *149999768* | *3057.977* | *1.003744* | *50000161* |
| *98* | *200000013* | *149999768* | *3057.892* | *1.003738* | *50000161* |
| *100* | *200000013* | *149999768* | *3057.806* | *1.003733* | *50000161* |
| *102* | *200000013* | *149999768* | *3057.721* | *1.003727* | *50000161* |
| *104* | *200000013* | *149999768* | *3057.636* | *1.003722* | *50000161* |
| *106* | *200000013* | *149999768* | *3057.55* | *1.003716* | *50000161* |
| *108* | *200000013* | *149999768* | *3057.465* | *1.003711* | *50000161* |
| *110* | *200000013* | *149999768* | *3057.381* | *1.003705* | *50000161* |
| *112* | *200000013* | *149999768* | *3057.296* | *1.0037* | *50000161* |
| *114* | *200000013* | *149999768* | *3057.211* | *1.003694* | *50000161* |
| *116* | *200000013* | *149999768* | *3057.127* | *1.003689* | *50000161* |
| *118* | *200000013* | *149999768* | *3057.042* | *1.003683* | *50000162* |
| *120* | *200000013* | *149999768* | *3056.958* | *1.003678* | *50000162* |
| *122* | *200000013* | *149999768* | *3056.874* | *1.003673* | *50000162* |
| *124* | *200000013* | *149999768* | *3056.79* | *1.003667* | *50000162* |
| *126* | *200000013* | *149999768* | *3056.706* | *1.003662* | *50000162* |
| *128* | *200000013* | *149999768* | *3056.622* | *1.003656* | *50000162* |
| *130* | *200000013* | *149999768* | *3056.538* | *1.003651* | *50000162* |
| *132* | *200000013* | *149999768* | *3056.455* | *1.003646* | *50000162* |
| *134* | *200000013* | *149999768* | *3056.372* | *1.00364* | *50000162* |
| *136* | *200000013* | *149999768* | *3056.288* | *1.003635* | *50000162* |
| *138* | *200000013* | *149999768* | *3056.205* | *1.003629* | *50000162* |
| *140* | *200000013* | *149999768* | *3056.122* | *1.003624* | *50000163* |
| *142* | *200000013* | *149999768* | *3056.039* | *1.003619* | *50000163* |
| *144* | *200000013* | *149999768* | *3055.956* | *1.003613* | *50000163* |
| *146* | *200000013* | *149999768* | *3055.874* | *1.003608* | *50000163* |
| *148* | *200000013* | *149999768* | *3055.791* | *1.003603* | *50000163* |
| *150* | *200000013* | *149999768* | *3055.709* | *1.003597* | *50000163* |
| *152* | *200000013* | *149999768* | *3055.626* | *1.003592* | *50000163* |
| *154* | *200000013* | *149999768* | *3055.544* | *1.003587* | *50000163* |
| *156* | *200000013* | *149999768* | *3055.462* | *1.003582* | *50000163* |
| *158* | *200000013* | *149999768* | *3055.38* | *1.003576* | *50000163* |
| *160* | *200000013* | *149999768* | *3055.298* | *1.003571* | *50000163* |
| *162* | *200000013* | *149999768* | *3055.217* | *1.003566* | *50000163* |
| *164* | *200000013* | *149999768* | *3055.135* | *1.00356* | *50000163* |
| *166* | *200000013* | *149999768* | *3055.054* | *1.003555* | *50000164* |
| *168* | *200000013* | *149999768* | *3054.972* | *1.00355* | *50000164* |
| *170* | *200000013* | *149999768* | *3054.891* | *1.003545* | *50000164* |
| *172* | *200000013* | *149999768* | *3054.81* | *1.003539* | *50000164* |
| *174* | *200000013* | *149999768* | *3054.729* | *1.003534* | *50000164* |
| *176* | *200000013* | *149999768* | *3054.648* | *1.003529* | *50000164* |
| *178* | *200000013* | *149999768* | *3054.568* | *1.003524* | *50000164* |
| *180* | *200000013* | *149999768* | *3054.487* | *1.003519* | *50000164* |
| *182* | *200000013* | *149999768* | *3054.406* | *1.003513* | *50000164* |
| *184* | *200000013* | *149999768* | *3054.326* | *1.003508* | *50000164* |
| *186* | *200000013* | *149999768* | *3054.246* | *1.003503* | *50000164* |
| *188* | *200000013* | *149999768* | *3054.166* | *1.003498* | *50000164* |
| *190* | *200000013* | *149999768* | *3054.086* | *1.003493* | *50000165* |
| *192* | *200000013* | *149999768* | *3054.006* | *1.003488* | *50000165* |
| *194* | *200000013* | *149999768* | *3053.926* | *1.003482* | *50000165* |
| *196* | *200000013* | *149999768* | *3053.846* | *1.003477* | *50000165* |
| *198* | *200000013* | *149999768* | *3053.767* | *1.003472* | *50000165* |
| *200* | *200000013* | *149999768* | *3053.687* | *1.003467* | *50000165* |

**2.3 BCS Freeware**

The simulation results are presented on a single window. At first, input data, intermediate calculations, and the calculated time × mass table for the reservoirs are listed in text format. Next, the plots for each reservoir are given (Figure S3).

|  |  |
| --- | --- |
|  |  |
|  |  |
|  | |

**Figure S3.** Graphs generated by BCS.

The full text content of the results window is reproduced as follows.

*Table of Fluxes*

*+0.000E00 +0.000E00 +0.000E00 +0.000E00 +5.330E-01*

*+0.000E00 +0.000E00 +0.000E00 +0.000E00 +8.170E-01*

*+5.000E-01 +7.500E-01 +0.000E00 +1.953E00 +0.000E00*

*+3.300E-02 +6.700E-02 +6.123E-01 +0.000E00 +2.400E00*

*+0.000E00 +0.000E00 +1.888E00 +3.092E00 +0.000E00*

*Table of Initial Masses*

*+2.000E08*

*+1.500E08*

*+3.062E03*

*+1.628E00*

*+5.000E07*

*Table of K*

*-2.665E-09 +0.000E00 +0.000E00 +0.000E00 +1.066E-08*

*+0.000E00 -5.447E-09 +0.000E00 +0.000E00 +1.634E-08*

*+2.500E-09 +5.000E-09 -8.167E-04 +1.200E00 +0.000E00*

*+1.650E-10 +4.467E-10 +2.000E-04 -3.100E00 +4.800E-08*

*+0.000E00 +0.000E00 +6.167E-04 +1.900E00 -7.500E-08*

*Table of Eigenvalues*

*-3.100E00*

*-7.392E-04*

*-2.686E-16*

*-3.141E-08*

*-3.696E-09*

*Table of Eigenvectors*

*+1.706E-09 +1.028E-05 +7.947E-01 +5.230E-01 +8.013E-01*

*+2.615E-09 +1.576E-05 +5.960E-01 +8.876E-01 -7.237E-01*

*-3.135E-01 +7.131E-01 +1.192E-05 -2.743E-05 -4.234E-06*

*+8.097E-01 +4.600E-05 +3.974E-09 -2.346E-08 -1.535E-09*

*-4.962E-01 -7.131E-01 +1.987E-01 -1.411E00 -7.752E-02*

*Table of Inverse Eigenvectors*

*-6.567E-11 -1.778E-10 -7.970E-05 +1.235E00 -1.912E-08*

*-4.864E-06 -9.813E-06 +1.402E00 +5.430E-01 -3.526E-05*

*+6.291E-01 +6.291E-01 +6.291E-01 +6.291E-01 +6.291E-01*

*+5.634E-02 +1.275E-01 -6.078E-01 -6.078E-01 -6.078E-01*

*+5.872E-01 -7.072E-01 -2.273E-01 -2.273E-01 -2.273E-01*

*Table of Normalization*

*+7.701E-01*

*+8.664E01*

*+2.517E08*

*-1.661E02*

*+1.292E02*

*Table of Coefficients*

*+1.314E-09 +8.909E-04 +2.000E08 -8.685E01 +1.035E02*

*+2.014E-09 +1.366E-03 +1.500E08 -1.474E02 -9.348E01*

*-2.414E-01 +6.178E01 +3.000E03 +4.555E-03 -5.469E-04*

*+6.235E-01 +3.986E-03 +1.000E00 +3.895E-06 -1.983E-07*

*-3.821E-01 -6.178E01 +5.000E07 +2.342E02 -1.001E01*

*Years Oxidize... Reduced... Soils Atmosphere Oceans*

*-1.300E02 +2.000E08 +1.500E08 +3.000E03 +1.000E00 +5.000E07*

*-1.287E02 +2.000E08 +1.500E08 +3.000E03 +1.612E00 +5.000E07*

*-1.274E02 +2.000E08 +1.500E08 +3.001E03 +1.623E00 +5.000E07*

*-1.261E02 +2.000E08 +1.500E08 +3.002E03 +1.624E00 +5.000E07*

*-1.248E02 +2.000E08 +1.500E08 +3.002E03 +1.624E00 +5.000E07*

*-1.235E02 +2.000E08 +1.500E08 +3.003E03 +1.624E00 +5.000E07*

*-1.222E02 +2.000E08 +1.500E08 +3.004E03 +1.624E00 +5.000E07*

*-1.209E02 +2.000E08 +1.500E08 +3.004E03 +1.624E00 +5.000E07*

*-1.196E02 +2.000E08 +1.500E08 +3.005E03 +1.624E00 +5.000E07*

*-1.183E02 +2.000E08 +1.500E08 +3.006E03 +1.624E00 +5.000E07*

*-1.170E02 +2.000E08 +1.500E08 +3.006E03 +1.624E00 +5.000E07*

*-1.157E02 +2.000E08 +1.500E08 +3.007E03 +1.624E00 +5.000E07*

*-1.144E02 +2.000E08 +1.500E08 +3.007E03 +1.624E00 +5.000E07*

*-1.131E02 +2.000E08 +1.500E08 +3.008E03 +1.624E00 +5.000E07*

*-1.118E02 +2.000E08 +1.500E08 +3.009E03 +1.624E00 +5.000E07*

*-1.105E02 +2.000E08 +1.500E08 +3.009E03 +1.624E00 +5.000E07*

*-1.092E02 +2.000E08 +1.500E08 +3.010E03 +1.624E00 +5.000E07*

*-1.079E02 +2.000E08 +1.500E08 +3.011E03 +1.624E00 +5.000E07*

*-1.066E02 +2.000E08 +1.500E08 +3.011E03 +1.624E00 +5.000E07*

*-1.053E02 +2.000E08 +1.500E08 +3.012E03 +1.624E00 +5.000E07*

*-1.040E02 +2.000E08 +1.500E08 +3.013E03 +1.624E00 +5.000E07*

*-1.027E02 +2.000E08 +1.500E08 +3.013E03 +1.624E00 +5.000E07*

*-1.014E02 +2.000E08 +1.500E08 +3.014E03 +1.624E00 +5.000E07*

*-1.001E02 +2.000E08 +1.500E08 +3.014E03 +1.624E00 +5.000E07*

*-9.880E01 +2.000E08 +1.500E08 +3.015E03 +1.625E00 +5.000E07*

*-9.750E01 +2.000E08 +1.500E08 +3.016E03 +1.625E00 +5.000E07*

*-9.620E01 +2.000E08 +1.500E08 +3.016E03 +1.625E00 +5.000E07*

*-9.490E01 +2.000E08 +1.500E08 +3.017E03 +1.625E00 +5.000E07*

*-9.360E01 +2.000E08 +1.500E08 +3.018E03 +1.625E00 +5.000E07*

*-9.230E01 +2.000E08 +1.500E08 +3.018E03 +1.625E00 +5.000E07*

*-9.100E01 +2.000E08 +1.500E08 +3.019E03 +1.625E00 +5.000E07*

*-8.970E01 +2.000E08 +1.500E08 +3.020E03 +1.625E00 +5.000E07*

*-8.840E01 +2.000E08 +1.500E08 +3.020E03 +1.625E00 +5.000E07*

*-8.710E01 +2.000E08 +1.500E08 +3.021E03 +1.625E00 +5.000E07*

*-8.580E01 +2.000E08 +1.500E08 +3.021E03 +1.625E00 +5.000E07*

*-8.450E01 +2.000E08 +1.500E08 +3.022E03 +1.625E00 +5.000E07*

*-8.320E01 +2.000E08 +1.500E08 +3.023E03 +1.625E00 +5.000E07*

*-8.190E01 +2.000E08 +1.500E08 +3.023E03 +1.625E00 +5.000E07*

*-8.060E01 +2.000E08 +1.500E08 +3.024E03 +1.625E00 +5.000E07*

*-7.930E01 +2.000E08 +1.500E08 +3.025E03 +1.625E00 +5.000E07*

*-7.800E01 +2.000E08 +1.500E08 +3.025E03 +1.625E00 +5.000E07*

*-7.670E01 +2.000E08 +1.500E08 +3.026E03 +1.625E00 +5.000E07*

*-7.540E01 +2.000E08 +1.500E08 +3.026E03 +1.625E00 +5.000E07*

*-7.410E01 +2.000E08 +1.500E08 +3.027E03 +1.625E00 +5.000E07*

*-7.280E01 +2.000E08 +1.500E08 +3.028E03 +1.625E00 +5.000E07*

*-7.150E01 +2.000E08 +1.500E08 +3.028E03 +1.625E00 +5.000E07*

*-7.020E01 +2.000E08 +1.500E08 +3.029E03 +1.625E00 +5.000E07*

*-6.890E01 +2.000E08 +1.500E08 +3.030E03 +1.625E00 +5.000E07*

*-6.760E01 +2.000E08 +1.500E08 +3.030E03 +1.625E00 +5.000E07*

*-6.630E01 +2.000E08 +1.500E08 +3.031E03 +1.626E00 +5.000E07*

*-6.500E01 +2.000E08 +1.500E08 +3.031E03 +1.626E00 +5.000E07*

*-6.370E01 +2.000E08 +1.500E08 +3.032E03 +1.626E00 +5.000E07*

*-6.240E01 +2.000E08 +1.500E08 +3.033E03 +1.626E00 +5.000E07*

*-6.110E01 +2.000E08 +1.500E08 +3.033E03 +1.626E00 +5.000E07*

*-5.980E01 +2.000E08 +1.500E08 +3.034E03 +1.626E00 +5.000E07*

*-5.850E01 +2.000E08 +1.500E08 +3.034E03 +1.626E00 +5.000E07*

*-5.720E01 +2.000E08 +1.500E08 +3.035E03 +1.626E00 +5.000E07*

*-5.590E01 +2.000E08 +1.500E08 +3.036E03 +1.626E00 +5.000E07*

*-5.460E01 +2.000E08 +1.500E08 +3.036E03 +1.626E00 +5.000E07*

*-5.330E01 +2.000E08 +1.500E08 +3.037E03 +1.626E00 +5.000E07*

*-5.200E01 +2.000E08 +1.500E08 +3.038E03 +1.626E00 +5.000E07*

*-5.070E01 +2.000E08 +1.500E08 +3.038E03 +1.626E00 +5.000E07*

*-4.940E01 +2.000E08 +1.500E08 +3.039E03 +1.626E00 +5.000E07*

*-4.810E01 +2.000E08 +1.500E08 +3.039E03 +1.626E00 +5.000E07*

*-4.680E01 +2.000E08 +1.500E08 +3.040E03 +1.626E00 +5.000E07*

*-4.550E01 +2.000E08 +1.500E08 +3.041E03 +1.626E00 +5.000E07*

*-4.420E01 +2.000E08 +1.500E08 +3.041E03 +1.626E00 +5.000E07*

*-4.290E01 +2.000E08 +1.500E08 +3.042E03 +1.626E00 +5.000E07*

*-4.160E01 +2.000E08 +1.500E08 +3.042E03 +1.626E00 +5.000E07*

*-4.030E01 +2.000E08 +1.500E08 +3.043E03 +1.626E00 +5.000E07*

*-3.900E01 +2.000E08 +1.500E08 +3.044E03 +1.626E00 +5.000E07*

*-3.770E01 +2.000E08 +1.500E08 +3.044E03 +1.626E00 +5.000E07*

*-3.640E01 +2.000E08 +1.500E08 +3.045E03 +1.626E00 +5.000E07*

*-3.510E01 +2.000E08 +1.500E08 +3.045E03 +1.626E00 +5.000E07*

*-3.380E01 +2.000E08 +1.500E08 +3.046E03 +1.627E00 +5.000E07*

*-3.250E01 +2.000E08 +1.500E08 +3.047E03 +1.627E00 +5.000E07*

*-3.120E01 +2.000E08 +1.500E08 +3.047E03 +1.627E00 +5.000E07*

*-2.990E01 +2.000E08 +1.500E08 +3.048E03 +1.627E00 +5.000E07*

*-2.860E01 +2.000E08 +1.500E08 +3.048E03 +1.627E00 +5.000E07*

*-2.730E01 +2.000E08 +1.500E08 +3.049E03 +1.627E00 +5.000E07*

*-2.600E01 +2.000E08 +1.500E08 +3.050E03 +1.627E00 +5.000E07*

*-2.470E01 +2.000E08 +1.500E08 +3.050E03 +1.627E00 +5.000E07*

*-2.340E01 +2.000E08 +1.500E08 +3.051E03 +1.627E00 +5.000E07*

*-2.210E01 +2.000E08 +1.500E08 +3.051E03 +1.627E00 +5.000E07*

*-2.080E01 +2.000E08 +1.500E08 +3.052E03 +1.627E00 +5.000E07*

*-1.950E01 +2.000E08 +1.500E08 +3.053E03 +1.627E00 +5.000E07*

*-1.820E01 +2.000E08 +1.500E08 +3.053E03 +1.627E00 +5.000E07*

*-1.690E01 +2.000E08 +1.500E08 +3.054E03 +1.627E00 +5.000E07*

*-1.560E01 +2.000E08 +1.500E08 +3.054E03 +1.627E00 +5.000E07*

*-1.430E01 +2.000E08 +1.500E08 +3.055E03 +1.627E00 +5.000E07*

*-1.300E01 +2.000E08 +1.500E08 +3.056E03 +1.627E00 +5.000E07*

*-1.170E01 +2.000E08 +1.500E08 +3.056E03 +1.627E00 +5.000E07*

*-1.040E01 +2.000E08 +1.500E08 +3.057E03 +1.627E00 +5.000E07*

*-9.100E00 +2.000E08 +1.500E08 +3.057E03 +1.627E00 +5.000E07*

*-7.800E00 +2.000E08 +1.500E08 +3.058E03 +1.627E00 +5.000E07*

*-6.500E00 +2.000E08 +1.500E08 +3.059E03 +1.627E00 +5.000E07*

*-5.200E00 +2.000E08 +1.500E08 +3.059E03 +1.627E00 +5.000E07*

*-3.900E00 +2.000E08 +1.500E08 +3.060E03 +1.627E00 +5.000E07*

*-2.600E00 +2.000E08 +1.500E08 +3.060E03 +1.627E00 +5.000E07*

*-1.300E00 +2.000E08 +1.500E08 +3.061E03 +1.627E00 +5.000E07*

*+0.000E00 +2.000E08 +1.500E08 +3.062E03 +1.628E00 +5.000E07*

*+2.000E00 +2.000E08 +1.500E08 +3.062E03 +1.005E00 +5.000E07*

*+4.000E00 +2.000E08 +1.500E08 +3.062E03 +1.004E00 +5.000E07*

*+6.000E00 +2.000E08 +1.500E08 +3.062E03 +1.004E00 +5.000E07*

*+8.000E00 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+1.000E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+1.200E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+1.400E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+1.600E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+1.800E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+2.000E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+2.200E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+2.400E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+2.600E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+2.800E01 +2.000E08 +1.500E08 +3.061E03 +1.004E00 +5.000E07*

*+3.000E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+3.200E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+3.400E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+3.600E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+3.800E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+4.000E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+4.200E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+4.400E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+4.600E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+4.800E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+5.000E01 +2.000E08 +1.500E08 +3.060E03 +1.004E00 +5.000E07*

*+5.200E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+5.400E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+5.600E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+5.800E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+6.000E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+6.200E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+6.400E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+6.600E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+6.800E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+7.000E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+7.200E01 +2.000E08 +1.500E08 +3.059E03 +1.004E00 +5.000E07*

*+7.400E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+7.600E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+7.800E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+8.000E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+8.200E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+8.400E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+8.600E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+8.800E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+9.000E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+9.200E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+9.400E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+9.600E01 +2.000E08 +1.500E08 +3.058E03 +1.004E00 +5.000E07*

*+9.800E01 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.000E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.020E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.040E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.060E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.080E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.100E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.120E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.140E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.160E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.180E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.200E02 +2.000E08 +1.500E08 +3.057E03 +1.004E00 +5.000E07*

*+1.220E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.240E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.260E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.280E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.300E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.320E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.340E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.360E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.380E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.400E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.420E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.440E02 +2.000E08 +1.500E08 +3.056E03 +1.004E00 +5.000E07*

*+1.460E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.480E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.500E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.520E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.540E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.560E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.580E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.600E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.620E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.640E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.660E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.680E02 +2.000E08 +1.500E08 +3.055E03 +1.004E00 +5.000E07*

*+1.700E02 +2.000E08 +1.500E08 +3.054E03 +1.004E00 +5.000E07*

*+1.720E02 +2.000E08 +1.500E08 +3.054E03 +1.004E00 +5.000E07*

*+1.740E02 +2.000E08 +1.500E08 +3.054E03 +1.004E00 +5.000E07*

*+1.760E02 +2.000E08 +1.500E08 +3.054E03 +1.004E00 +5.000E07*

*+1.780E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.800E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.820E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.840E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.860E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.880E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.900E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.920E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.940E02 +2.000E08 +1.500E08 +3.054E03 +1.003E00 +5.000E07*

*+1.960E02 +2.000E08 +1.500E08 +3.053E03 +1.003E00 +5.000E07*

*+1.980E02 +2.000E08 +1.500E08 +3.053E03 +1.003E00 +5.000E07*

*+2.000E02 +2.000E08 +1.500E08 +3.053E03 +1.003E00 +5.000E07*