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Ben Foster <foster@ucar.edu>

Questions for TIEGCM

10 messages

金锐 <r.jin.shao@gmail.com> Sat, Dec 19, 2015 at 9:52 AM
To: foster@ucar.edu

Dear Prof. Ben Foster

Excuse me I am a student in Shanghai Astronomical Observatory, Chinese Acadamy of Science. Recently, I intend to use TIEGCM 1.95 to simulate the TEC varation during geomagnetic
storms. As claimed in the homepage of TIEGCM (http://www.hao.ucar.edu/modeling/tgcm/tiegcm1.95/userguide/html/namelist.html#source) , the model may be supported at 2.5
-deg resolution. Could you tell me how I can get the source file to start up TIEGCM with "modelres=2.5"? And where can I download GSWM files for 2.5-degree TIEGCM?

I'm looking forward your reply !
Best Regards
Rui Jin

Ben Foster <foster@ucar.edu> Sat, Dec 19, 2015 at 11:45 AM
To: 金锐 <r.jin.shao@gmail.com>, Joe McInerney <joemci@ucar.edu>

Rui Jin,

Files for tiegcm 2.5-deg resolution can be downloaded at

http://download.hao.ucar.edu/pub/tgcm/tiegcm1.95/

Source startup files at 2.5-deg have "dres" in their names.
GSWM files for this resolution have "2.5d" in their names.
You should use a 30-second timestep (STEP=30) at this res,
maybe less if simulating storm conditions.
Keep in mind that the TEC calculated in the model is
integrated from top to bottom of the model domain (not to
the ground).

--Ben

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Ben Foster
National Center for Atmospheric Research (NCAR)
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303-497-1595

金锐 <r.jin.shao@gmail.com> Sun, Dec 20, 2015 at 6:34 AM
To: Ben Foster <foster@ucar.edu>

Thank you very much for your kindly reply. Now I can run the model. As we need one month simulation result, I try to run the model with multi-nodes using intel-MPI. The model run without problems using one computing node, however it crash when I try to use 2 or more computing nodes. The error is as follows,
mytid= 26 mytidi,j= 2 3 lat0,1= 37 48 (12) lon0,1= 39 57 (19) ncells= 228

"mytid= 25 mytidi,j= 1 3 lat0,1= 37 48 (12) lon0,1= 20 38 (19) ncells= 228
[36:node039.cm.cluster] unexpected disconnect completion event from [33:node016.cm.cluster]
Assertion failed in file ../../dapl_conn_rc.c at line 1054: 0
internal ABORT - process 36
[30:node016.cm.cluster] unexpected disconnect completion event from [0:node032.cm.cluster]
Assertion failed in file ../../dapl_conn_rc.c at line 1054: 0
internal ABORT - process 30"
.....

Could you give me some advice to adjust this problem?? Or it's a problem about MPI (Intel(R) MPI Library 4.0 Update 3 for Linux*)??

Best Regards
Rui Jin
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金锐 <r.jin.shao@gmail.com> Sun, Dec 20, 2015 at 8:07 PM
To: Ben Foster <foster@ucar.edu>

I am sorry to disturb you again. Just one more small question? Could you tell me the upper boundary for the TEC integration？ （I do not found it in the model description）

Best Regards
Rui Jin
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Ben Foster <foster@ucar.edu> Mon, Dec 21, 2015 at 9:59 AM
To: 金锐 <r.jin.shao@gmail.com>, Joe McInerney <joemci@ucar.edu>

Rui Jin,

The model integrates electron density from bottom to top
of the model (zp -7 to +7). Here's the code from subroutine
mkdiag_TEC in diags.F (height at the top varies with space
and time, see geopotential height Z):

```
!
! Integrate electron content in height at current latitude:
      tec(:) = 0.
      do i=lon0,lon1
        do k=lev0,lev1-1
          tec(i) = tec(i)+(z(k+1,i)-z(k,i))*electrons(k,i)
        enddo
      enddo
```

--Ben
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Ben Foster <foster@ucar.edu> Mon, Dec 21, 2015 at 10:20 AM

To: 金锐 <r.jin.shao@gmail.com>, Joe McInerney <joemci@ucar.edu>

Rui Jin,

I'm not sure how much I can help with this. What platform/machine are you running on? Could you please send me output from the command "uname -a".

Looks like you are using 64 mpi tasks (processors). How many processors per node on your cluster, and how many nodes? When you say it runs without problems "using one computing node", does that mean a single mpi task? You might try running with < 64 tasks, maybe start w/ 4 tasks, just a short test run, and if that succeeds try 8, 16, 32, etc. Also, when it fails, please send me the entire stdout file. Thanks,

--Ben

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金锐 <r.jin.shao@gmail.com> Mon, Dec 21, 2015 at 5:20 PM
To: Ben Foster <foster@ucar.edu>

the platform/machine information is as follows (uname -a)
Linux bright60 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013 x86_64 x86_64 x86_64 GNU/Linux
There are 12 processors per node on our cluster, and 50 nodes. "using one computing node" means set bsub -n 12, bsub -R "span[ptile=12]";
Acorrding to your suggestion, I run the model with " bsub -n 64, bsub -R "span[ptile=8]" and " bsub -n 32, bsub -R "span[ptile=8]" , the outputs
are as the attachments. Thanks

Best Regards
Rui Jin

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2 attachments

tiegcm_dec2006_test32.out
317K

tiegcm_dec2006_test64.out
267K

Ben Foster <foster@ucar.edu> Mon, Dec 21, 2015 at 8:38 PM
To: 金锐 <r.jin.shao@gmail.com>, Joe McInerney <joemci@ucar.edu>

Rui Jin,

Ok, this is a known problem with some compiler/platform/mpi combinations. It has to do with reading the namelist input file. This is clear from the error message in the np=64 output file:

forrtl: severe (24): end-of-file during read, unit 7,

Its less clear in the 32-proc output, but I suspect its a similar problem.

I won't bore you with the backstory, but I have a potential solution that you can try. Follow these steps:

1. Replace the source file inp_read.F with the attached file of the same name.
2. For all comments in your namelist input file, replace the semi-colon comment character ';' with an exclamation point '!' (or remove the comments).
3. In your job script, change the mpirun execution statement from:
   mpirun.lsf $model < $input >&! $output
   to:
   mpirun.lsf $model $input >&! $output
4. Recompile and rerun (i.e., submit the job script).

Regarding step 3, since you mentioned bsub, I suspect your system is running LSF "Load Sharing Facility", and you are using a modified version of scripts/tiegcm-ys.job from tiegcm1.95 (it might be helpful if you include the job script you are using in your next email, thanks).

Even if you are executing some other flavor of mpirun (or using tiegcm-linux.job), you should still be able to remove the redirection '<' from the command as above. This means it is passing the namelist input file path through an argument to the fortran program rather than redirecting stdin from unit 5. The latter method works only if the mpi launcher redirects unit 5 separately to all mpi tasks. The new method allows access to the file path with the fortran intrinsic "getarg" (see attached inp_read.F). Then the mpi tasks can read the file from their own private logical file unit (not unit 5).

Hope this works, let me know...

--Ben

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inp_read.F
2K

金锐 <r.jin.shao@gmail.com> Wed, Dec 23, 2015 at 7:02 PM
To: Ben Foster <foster@ucar.edu>

Thanks for your valuable advise. The problem has been soloved ! 😊

Best Regards

Rui

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Ben Foster <foster@ucar.edu> Thu, Dec 24, 2015 at 8:12 AM
To: 金锐 <r.jin.shao@gmail.com>, Joe McInerney <joemci@ucar.edu>

Great, thanks for letting me know!

Sent from my iPhone

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