

Ben Foster <foster@ucar.edu>

possible TIE-GCM bug involving ZG, ZGMID, and WN

6 messages

SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI <eric.sutton.5@us.af.mil>
To: "foster@ucar.edu" <foster@ucar.edu>

Tue, May 5, 2015 at 5:13 PM

Hi Ben,

I'd like to submit this small commit for your consideration. I came across a couple of issues related to the calculation of the top ZG value and the top 2 ZGMID values. I'm attaching before and after plots of ZG and ZGMID vs. log-pressure in the pdf file. Also, it looks like WN is calculated on the interfaces, but secondary histories claim it to be on the midpoints.

I checked out the most current TIE-GCM trunk (r1179), and then made changes to the attached files (addiag.F and diags.F). See the file differences below. These issues probably exist in TIME-GCM as well, but I haven't checked.

Here's a log, in case you end up committing these changes (feel free to modify or rephrase however you'd like):

- This commit fixes a bug in the calculation of ZG at the top interface level in addiags.F. Previously, ZG(lev1-2) and ZG(lev1-1) values were extrapolated to the midpoint between ZG(lev1-1) and ZG(lev1); now these values are extrapolated to the interface at lev1. This change subsequently improves the value of ZGMID(lev1) as well.
- A similar bug was fixed in the extrapolation of ZGMID(lev1) in diags.F.
- The level for WN on secondary history files was changed from 'lev' to 'ilev' to reflect that it is calculated on the interface levels.

Thanks and I hope all is well,
-Eric


```
diff src/addiag.F altsrc/addiag.F
273c273
<          zg(lev1,i,j) = 1.5*zg(lev1-1,i,j)-0.5*zg(lev1-2,i,j)
---
>          zg(lev1,i,j) = 2.0*zg(lev1-1,i,j)-zg(lev1-2,i,j)
```

```
diff src/diags.F altsrc/diags.F
1204c1204,1205
<      |   diags(ix)%units,wn,'lev',lev0,lev1,'lon',lon0,lon1,lat)
---
>      |   diags(ix)%units,wn,diags(ix)%levels,lev0,lev1,
>      |   'lon',lon0,lon1,lat)
1347c1348
<      zgmid(lev1,:) = 1.5*zgmid(lev1-1,:)-0.5*zgmid(lev1-2,:)
---
```

> zgmid(lev1,:) = 2.0*zgmid(lev1-1,:)-zgmid(lev1-2,:)

3 attachments

 **diags.F**
48K

 **addiag.F**
9K

 **ZGandZGMID.pdf**
7K

Ben Foster <foster@ucar.edu>

Wed, May 6, 2015 at 12:34 PM

To: "SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI" <eric.sutton.5@us.af.mil>, "Stanley C. Solomon" <stans@ucar.edu>, Wenbin Wang <wbwang@ucar.edu>, Hanli Liu <liuh@ucar.edu>

Thanks Eric. I can't look at this right now, but am forwarding it to Stan, [et.al](#).

--Ben

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Ben Foster
National Center for Atmospheric Research (NCAR)
High Altitude Observatory (HAO)
[303-497-1595](tel:303-497-1595)

Stan Solomon <stans@ucar.edu>

Thu, May 7, 2015 at 7:01 AM

To: "SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI" <eric.sutton.5@us.af.mil>

Cc: Ben Foster <foster@ucar.edu>, Wenbin Wang <wbwang@ucar.edu>, Hanli Liu <liuh@ucar.edu>

We've long been aware of the problem with ZG at the top level. Thanks for doing something about it. I'll take a look when I get back.

SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI <eric.sutton.5@us.af.mil>

Thu, May 7, 2015 at 8:46 AM

To: Stan Solomon <stans@ucar.edu>

Cc: Ben Foster <foster@ucar.edu>, Wenbin Wang <wbwang@ucar.edu>, Hanli Liu <liuh@ucar.edu>

That's right, I remember some talk about it last time I was in town. Not a problem, it was a very easy fix.

-Eric

From: Stan Solomon [stans@ucar.edu]

Sent: Thursday, May 07, 2015 7:01 AM

To: SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI

Cc: Ben Foster; Wenbin Wang; Hanli Liu

Subject: Re: possible TIE-GCM bug involving ZG, ZGMID, and WN

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Ben Foster <foster@ucar.edu>

Tue, May 19, 2015 at 10:04 AM

To: "SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI" <eric.sutton.5@us.af.mil>

Cc: Stan Solomon <stans@ucar.edu>, Wenbin Wang <wbwang@ucar.edu>, Hanli Liu <liuh@ucar.edu>

Eric,

I finally have some breathing room from work on WACCM, so have made these corrections to tiegcm/trunk. You should have received email of the commit. Thanks for pointing this out. I will check timegcm and make the same corrections if necessary.

--Ben

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SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI <eric.sutton.5@us.af.mil> Tue, May 19, 2015 at 11:19 AM

To: Ben Foster <foster@ucar.edu>

Cc: Stan Solomon <stans@ucar.edu>, Wenbin Wang <wbwang@ucar.edu>, Hanli Liu <liuh@ucar.edu>

Thanks Ben,

-Eric

-----Original Message-----

From: Ben Foster [mailto:foster@ucar.edu]

Sent: Tuesday, May 19, 2015 10:05 AM

To: SUTTON, ERIC K DR-02 USAF AFMC AFRL/RVBXI

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