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Ben Foster <foster@ucar.edu>

TIEGCM source histories

8 messages

Juan Durazo <jdurazo@asu.edu> Tue, Oct 14, 2014 at 5:07 PM
To: foster@ucar.edu

Hello,

I am a phd student at Arizona state university that recently started using the TIEGCM and I have a question about using the primary history files. I have already downloaded and installed the TIEGCM version 1.94, as well as made a few simulations using the input files that come with the source code.

I am attempting to run the the TIEGCM to compare its electron density output with some observations of electron density profiles taken with the COSMIC satellite missions at some given date, say March,21 2012.

I have obtained the values of F107 solar input and the KP indices that corresponds to this date so I can include them in the input file to run TIEGCM. However, I am not sure how I can obtain the primary source file that corresponds to this date. To my knowledge, I need this primary source file to get the state of some variables in the model at the beginning of the simulation.

I was wondering how I could go about obtaining this source start up file to make a run in the TIEGM? If you are not the correct person I should have sent this question to, could you please refer me to someone that can help me?

Thank you,

--
Juan Durazo

Ben Foster <foster@ucar.edu> Thu, Oct 16, 2014 at 11:41 AM
To: Juan Durazo <jdurazo@asu.edu>

Juan, for the March 21 date you can use the March equinox history file in the data download, either solar min or max, day 80. For dates other than solstices or equinoxes, we have a full year climatology run so you can start from any date. I will help you more on this next week when I get back from vacation.

Sent from my iPhone
[Quoted text hidden]

Juan Durazo <jdurazo@asu.edu> Thu, Oct 16, 2014 at 2:21 PM
To: Ben Foster <foster@ucar.edu>

Alright I will proceed with this and see how far I can get. I will email you next week if I run into a problem.

Thanks,

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Juan Durazo

Juan Durazo <jdurazo@asu.edu> Mon, May 4, 2015 at 1:21 PM
To: Ben Foster <foster@ucar.edu>

Hello,

I am a phd student at Arizona state university and am using the TIEGCM version 1.94 for a data assimilation project.

I read in the documentation that it is possible to run a simulation using the HEELIS potential model and also include effects of IMF_By(By component of interplanetary magnetic field) in the simulation.

What I want to do is use historical values of BY from the IMF files but I read in the documentation that it is not possible to use HEELIS potential model and also IMF data at the same time.

I was wondering if you had some suggestion on how I can go about this.

Thank you,

[Quoted text hidden]
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Juan Durazo

Ben Foster <foster@ucar.edu> Tue, May 5, 2015 at 4:37 PM
To: Juan Durazo <jdurazo@asu.edu>

Juan,
Right, but you can run WIEMER potential and also IMF data at the same time. But you must comment out CTPOTEN, since it will be calculated from the weimer output. So you could have the following in your namelist input file (note CTPOTEN is commented out):

```
 POTENTIAL_MODEL = 'WEIMER'

;CTPOTEN = 30.

  IMF_NCFILE = '$TGCMDATA/imf_OMNI_2002001-2002365.nc'
```

--Ben

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

Juan Durazo <jdurazo@asu.edu> Thu, May 14, 2015 at 7:06 PM
To: Ben Foster <foster@ucar.edu>

I see. Thank you that was helpful. I have one more question:

I will be giving a presentation at the SIAM conference on applications of dynamical systems. In the work I will present, I use the TIEGCM model to obtain my results and will also have a brief overview of the model. I was wondering if I need some special permission before I do my presentation. Or maybe you need to see a copy of the presentation?

Thanks,

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Juan Durazo
[Quoted text hidden]
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Juan Durazo

Ben Foster <foster@ucar.edu> Thu, May 14, 2015 at 10:18 PM
To: "Stanley C. Solomon" <stans@ucar.edu>

Sent from my iPhone

Begin forwarded message:

> **From:** Juan Durazo <jdurazo@asu.edu>
> **Date:** May 14, 2015 at 7:06:31 PM MDT
> **To:** Ben Foster <foster@ucar.edu>
> **Subject: Re: TIEGCM source histories**
>
> [Quoted text hidden]

Stan Solomon <stans@ucar.edu> Fri, May 15, 2015 at 9:59 AM
To: jdurazo@asu.edu
Cc: Ben Foster <foster@ucar.edu>

Juan -

You don't need special permission to describe the TIE-GCM in a presentation (or publication). We always appreciate acknowledgement of HAO/NCAR and the principal developers, and citation of the appropriate papers. The information you need should all be available on the web site.

With regard to your By question, it is possible to use a By value with the Heelis potential model, but you need to add it by hand in the namelist input file. Usually, people put in a single value for test cases or sensitivity studies. However, I believe it is possible to put in a time sequence. But the way the model is set up, only the Weimer model works directly off of the IMF input files. Weimer should be a better model, and has much greater time resolution, since Heelis runs off of 3-hour Kp. However, the Heelis model has more "heritage" behind it in the sense that there has been much more validation of the TIE-GCM using Heelis than Weimer, since the Weimer option is relatively new. Also, the model might be more crash-prone with Weimer.

It would be possible to implement By from the IMF input files while using Heelis; we just have never coded up this option, since there isn't much demand for it.

Using By with Heelis at high time resolution could also give some peculiar results. For instance, if By were very

large, but Bz was relatively small, while Kp was still high, then by adding a large By to a Heelis potential that was already responding to a high Kp would be in some sense double-counting the forcing. I guess if I were doing this I would probably average By onto 3-hour intervals, in order to follow the primary cadence.

Stan

--

Stanley C. Solomon
High Altitude Observatory
National Center for Atmospheric Research
Boulder, Colorado, USA