CCMC Runs on Request

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General Goal: Provide Services

to the general research community
and to model developers

■ Provide general research community **user-friendly** access to a **variety** of research models and model combinations.

■ Expose state-of-the-art models and their creators to the broad research community.

■ Reduce non-scientific workload of model creators

■ Facilitate models testing by a large number of researchers

■ Collect and analyze community feedback

Available Models

3D Global MHD Magnetospheric Models:
BAT-S-RUS (University of Michigan)
UCLA-GGCM (UCLA), includes CITM

May
October

Standalone Ionospheric Model
Low- to mid latitude code SAMI2 (NRL)

October
(last week)

Radiation Belt/Ring Current Model
M-C Fok Bounce-averaged kinetic model
(NASA GSFC)

September

3D Global MHD Magnetospheric Models:

Initial restrictions for automated runs:

Predefined size of the simulation box
$|Z|,|Y| < 48$ Re, -252 Re$< X < 33$ Re(in GSM)

Fixed simulation grid with less than 500000 grid cells
(finest grid resolution is 1/4 Re)

2 hour real time after startup

Special Requests:

Long runs: 10-24 hours

Higher resolution runs
Other box dimensions

Submission Procedure on the Web

http://ccmc.gsfc.nasa.gov/

- **Step 1:** generate a run registration number

  (provide name, telephone, address, e-mail)

- **Step 2:** choose the simulation model

  (e.g., BAT-S-RUS or UCLA-GGCM)

- **Step 3**: choose the input parameters.

- **Step 4:** upload upstream SW input file (optional)

- **Step 5:** specify the output frequency,

  specify output processing options

  (e.g., run Ring Current model, and/or

  calculate the polar oval position, etc ..) ,

  provide run title,

  special requests, comments (optional).

Step 3: Choose the Input Parameters

Set the Initial Solar Wind (SW) Parameters in GSM Coordinates:

SW Density [n/cc]: `5.`

SW Temperature [K]: `182000.`

X Component of SW Velocity [km/s]: `-400.`

Y Component of SW Velocity [km/s]: `0.`

Z Component of SW Velocity [km/s]: `0.`

X Component of SW Magnetic Field [nT]: `0.`

Y Component of SW Magnetic Field [nT]: `0.`

Z Component of SW Magnetic Field [nT]: `5.`

Set the Real Time at the Beginning of the Run:

Year: `2000`   Month: `3`   Day: `21`   Hour: `10`   Minute: `10`

Specify the Dipole Orientation:

(●) No Dipole Tilt, Dipole is Parallel to the Z Axis

( ) Initial Dipole Tilt Corresponds to the Real Time at the Beginning of the Run, Dipole Tilt is Updated with Time for Time–Dependent Simulations

Choose Fixed or Time–Dependent SW Input:

(●) Fixed Inflow Boundary Conditions, Upstream SW Input File is Not Required

( ) Time–Dependent Inflow Boundary Conditions, Upstream SW Input File is Required

Choose the Radio Flux 10.7 cm for ionospheric calculations: `150.`

Submit   Reset

Step 4: Upload Upstream SW Input File

The file size should not exceed 50 kbytes.

Fill path name to the solar wind (SW) input file at your local disk should not contain any blank spaces or quotation marks.

SW data should be projected to 33 R_E.
The SW parameters in the input file should be provided in the following order:

Year Month Day Hour Min Sec Msec Bx[nT] By[nT] Bz[nT] Vx[km/s] Vy[km/s] Vz[km/s] N[cm^(−3)] T[Kelvin]

Please Enter File to Upload: [   ] Browse...

[Press] to upload the file! Reset

The same input format for all MHD models,
submission script makes necessary transformations.

IDL and FORTRAN write statements are provided.

Some users requested transformation routine from
ACE Level 2 data format.

Output/Visualization Services

- **Automated Web Visualization:**

  - color contours of MHD plasma and field parameters,

  - line plots between two selected points,

  - vectors, field lines,

  - electrostatic potential, currents, flows in ionosphere,

  - polar oval position (optional),

  - pitch-angle averaged particle fluxes at the at the equatorial plane (optional).

  [details in *Lutz Rastaetter presentation*]

- **Special Requests**:

  - Output on requested grids,

  - Original MHD output + explanations how to read data + visualization software.

Overview of First Requests

Results of 27 requested runs are on the Web:

15 standard 2 hour run requests for variety of fixed SW conditions;

2 standard 2 hour requests for time dependent simulations of specific events,

6 special 2 hour run requests for fixed SW conditions and increased resolution in magnetopause/shock area;

3 special requests for long runs (> 10 hours) of specific events.

We expect more requests for long runs.

Requests for Output/Visualization

Majority of users prefer Web visualization, may want additional options;

2 requests for outputs on specific 3D XYZ grid, and/or on 2D grid;

2 requests for original MHD data + reading routine + visualization software.

We are flexible to support what users require!

Outlook

We are periodically improving the submission procedure and adding output analysis options

Near future plans:

- allow selection of different run lengths (up to 12 hours) for automatic submissions;

- introduce interactive choice of different simulation grids;

- allow choices for the conductance model;

- introduce more ionospheric, solar and heliospheric models;

- allow selection of model combination.

We are looking for input from research and operations communities.

Summary

We were surprised by the large number requests during first few months.

Two latest requests received at the end of last week (1 long MHD run, 1 ionosphere run)

Researches are still discovering this opportunity

We expect to receive more requests.

We will continuously improve service to satisfy user needs.