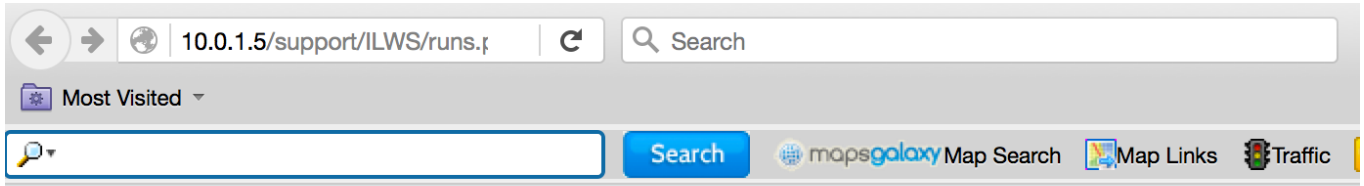
On-Line Visualization

Quiet Magnetosphere



CCMC Runs-on-request system: demo and hands-on

Sun to L1:

Heliosphere

Results of WSA-ENLIL Cone model simulations:

- Demo run and tutorial
- Runs

Local Network:
http://10.0.1.5/support/ILWS/runs.php

L1 to Geospace:

Magnetosphere

Results of SWMF model simulations:

- Demo run and tutorial
- Runs with artificial conditions
- Real event simulations

Click here

Inner Magnetosphere

Results of inner magnetospheric models simulations (Ring Current, Radiation Belt and CIMI models)

- Demo run and tutorial
- CIMI model run

Ionosphere

Results of CTIPe model simulations:

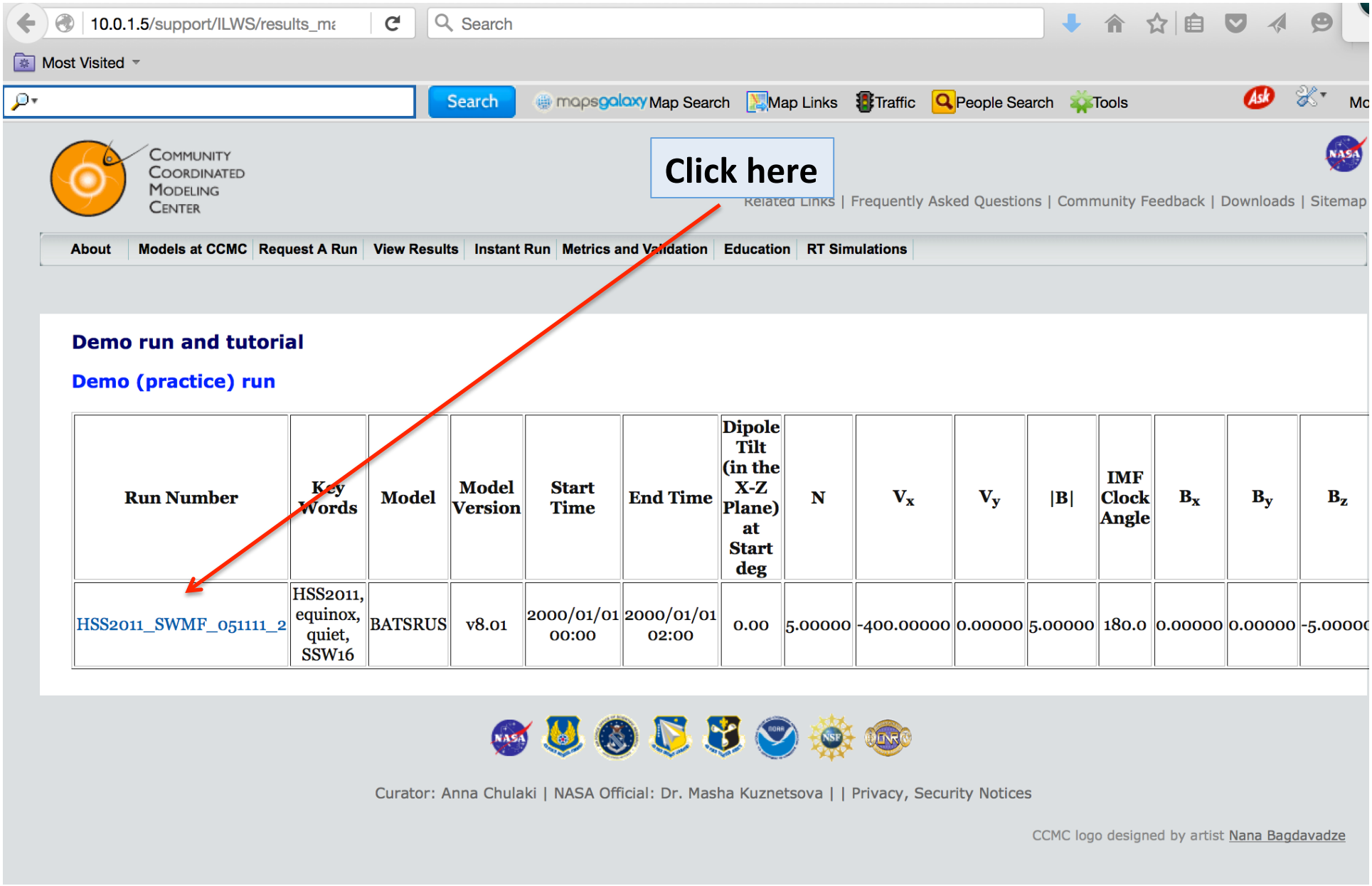
- Demo run and tutorial
- Runs with artificial conditions
- Real event simulations

Internet:
http:/ccmc.gsfc.nas.agov/support/ILWS/runs.php

Local Physics

Results of PIC-Hesse model simulation:

- Demo run


10.0.1.5/support/ILWS/results_ma
Search
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Search
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Map Links
Traffic
People Search
Tools
Community Coordinated Modeling Center
Click here
Related Links | Frequently Asked Questions | Community Feedback | Downloads | Sitemap
About
Models at CCMC
Request A Run
View Results
Instant Run
Metrics and Validation
Education
RT Simulations
Demo run and tutorial
Demo (practice) run
Run Number
Key Words
Model
Model Version
Start Time
End Time
Dipole Tilt (in the X-Z Plane) at Start deg
N
Vx
Vy
|B|
IMF Clock Angle
Bx
By
Bz
HSS2011_SWMF_051111_2
HSS2011, equinox, quiet, SSW16
BATSRUS
v8.01
2000/01/01 00:00
2000/01/01 02:00
0.00
5.00000
-400.00000
0.00000
5.00000
180.0
0.00000
0.00000
-5.00000
Curator: Anna Chulaki | NASA Official: Dr. Masha Kuznetsova | | Privacy, Security Notices
CCMC logo designed by artist Nana Bagdavadze

On-Line Visualization: Quiet Magnetosphere

HSS2011_SWMF_051111_2

Title/Introduction:

Key Word: HS2010, equinox, quiet

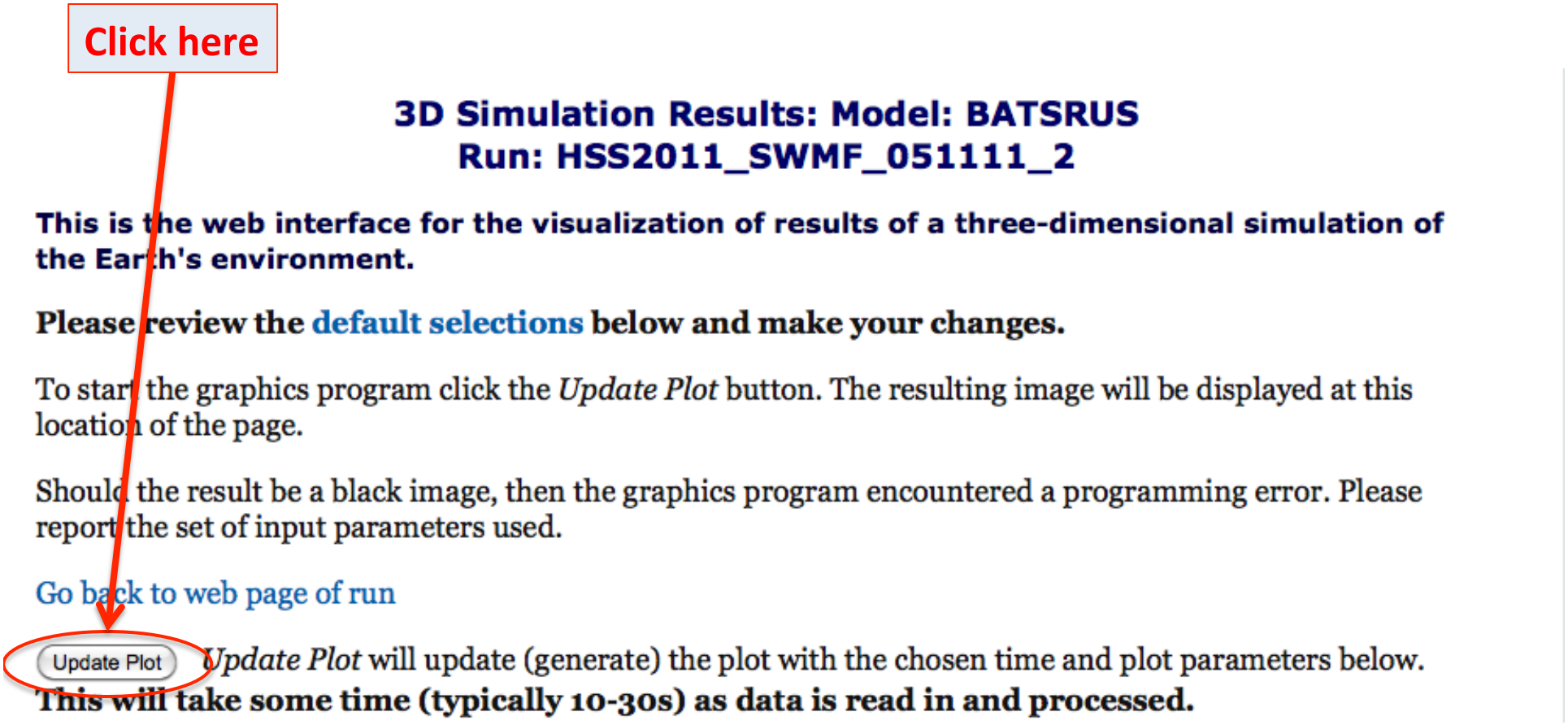
3D MHD Model: BATSRUS
Simulation With Modeled Conditions
Inflow Boundary Conditions: Fixed
Start Time: 2000/01/01 00:00
End Time: 2000/01/01 02:00
Dipole Tilt at Start in X-Z Plane: 0.0 deg.
Dipole Tilt in Y-Z GSE Plane: 0.0 deg.
Dipole Update With Time: no
Ionospheric Conductance: uniformp5,h0
No Corotation Velocity is Applied at The Inner Boundary.
Radio Flux 10.7 cm: 150.
Coordinate System for the Output: GSM
Initial Solar Wind (SW) Parameters in GSM Coordinates:

SW Density: 5.00 n/cc
SW Temperature [Kelvin]: 232100.00 Kelvin
X Component of SW Velocity: -400.00 km/sec
Y Component of SW Velocity: 0.00 km/sec
Z Component of SW Velocity: 0.00 km/sec
IMF Bx: 0.00 nT
IMF By: 0.00 nT
IMF Bz: -5.00 nT
IMF |B|: 5.00 nT
IMF Clock Angle: 180.0 deg.

- View solar wind input data
- List solar wind input data in ASCII format (see format description here).
- View Magnetosphere
- Create Timeseries in Magnetosphere
- View Ionosphere
- View Northern hemisphere polar cap flux and area
- View Southern hemisphere polar cap flux and area
- View Magnetopause standoff and closest approach within 30 deg. of Sun-Earth line (local noon)
- View Polar cap boundary at 24 magnetic local times
- View Ionospheric dissipation Ring Current data:
- View Ring Current H+ ion data
- View Ring Current electron data

Click here

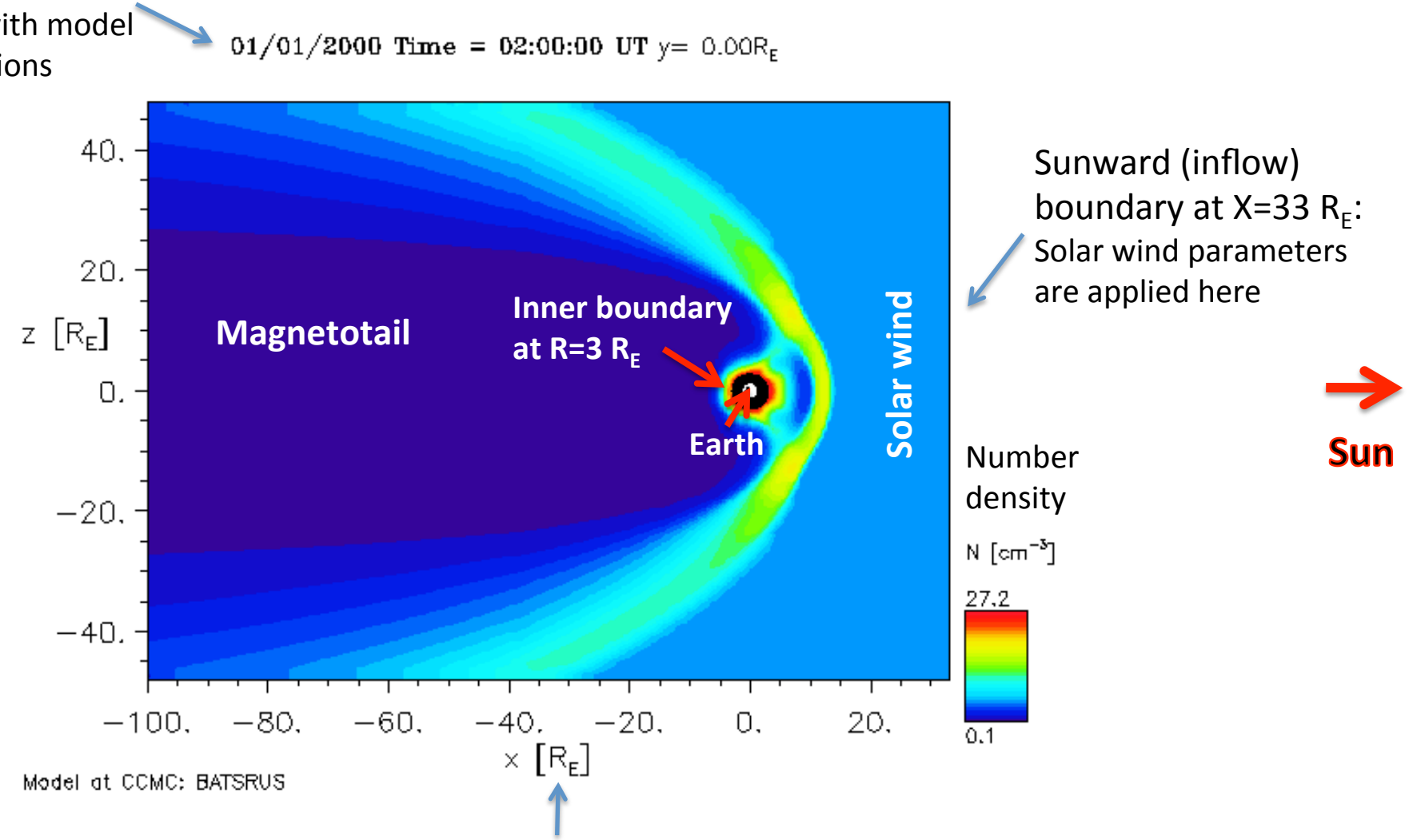
Make a First Plot with Default Selections



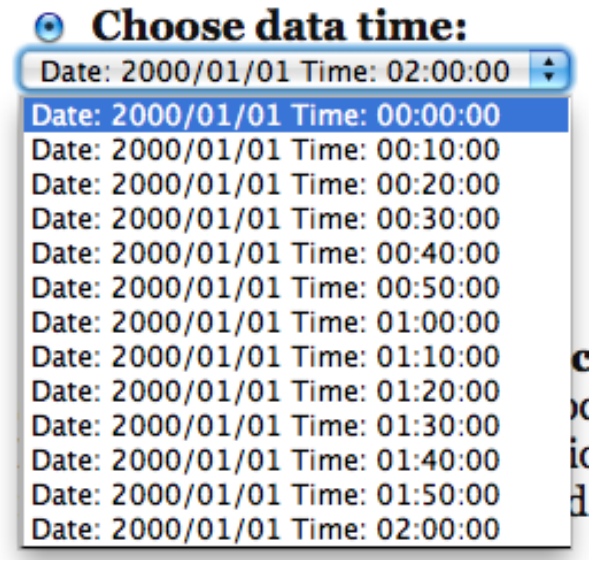
Magnetosphere Overview Plot: Color Contour

Number density in noon-midnight meridianal plane (Y=0)

Default date for runs with model conditions



Select time step



Choose time step from the pull-down menu

Click "**Update Plot**" to make a plot with default selections

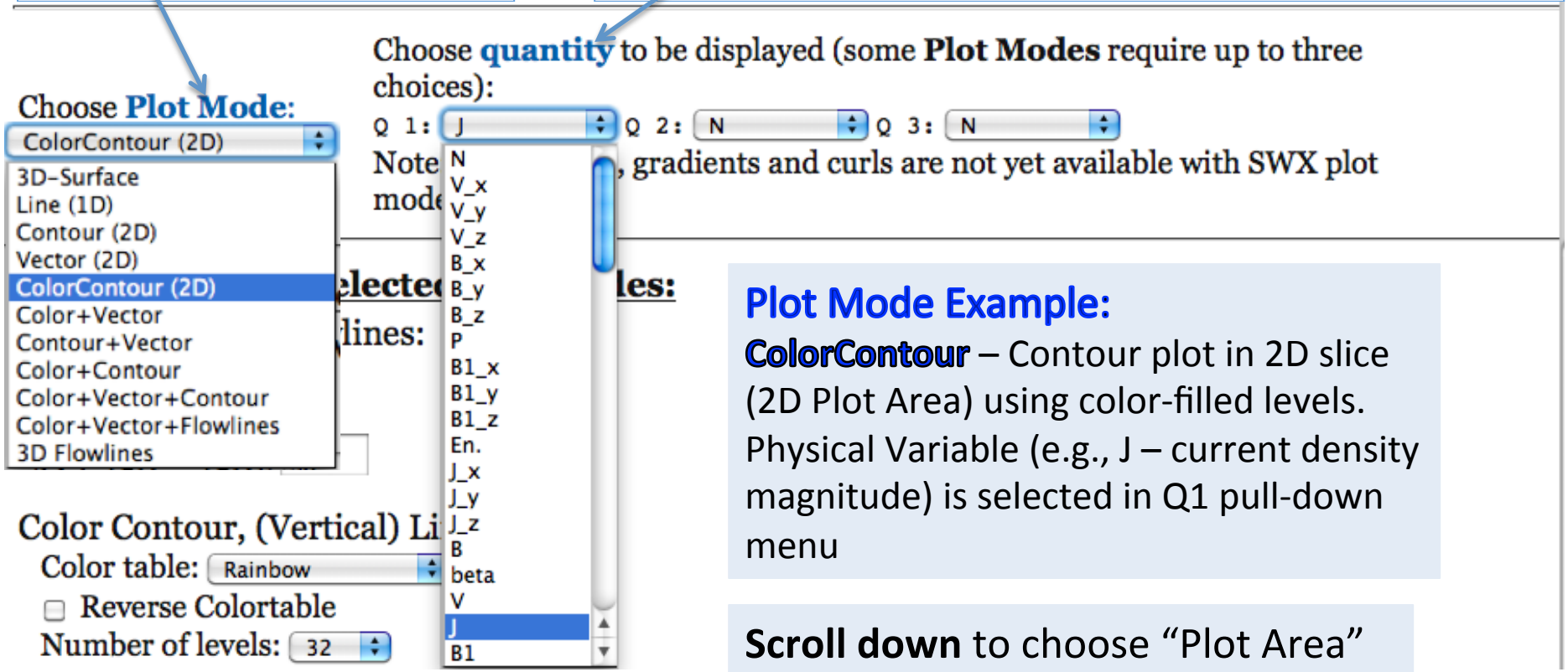
OR

Scroll down to modify default selections such as "Physical Variables", "Plot Mode", "Plot Area", "Plot Options", etc.

Select Plot Mode and Physical Variables to be Displayed from Pull-Down Menus

Click here for Plot Modes description

Click here for the complete list of physical variables written by global MHD models

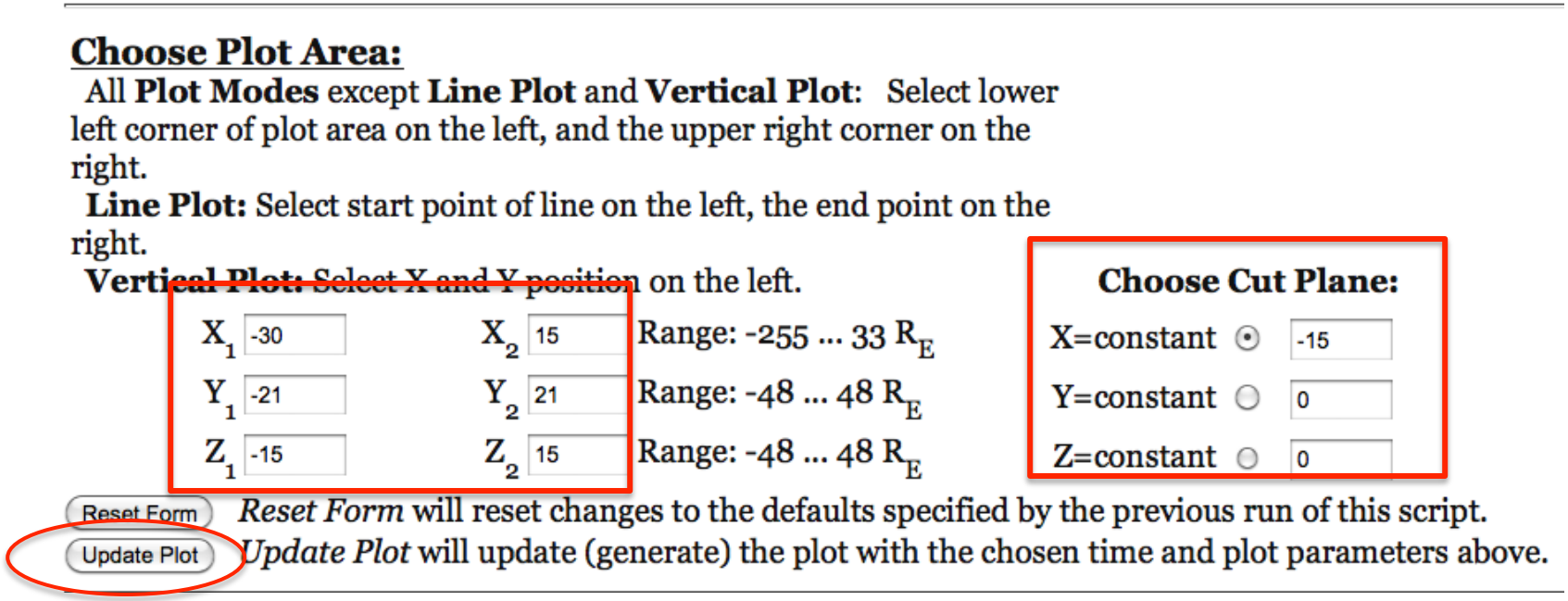


Plot Mode Example:

ColorContour – Contour plot in 2D slice (2D Plot Area) using color-filled levels. Physical Variable (e.g., J – current density magnitude) is selected in Q1 pull-down menu

Scroll down to choose “Plot Area”

Choose Plot Area



Choose Cut Plane, e.g.,

- Y = 0 – noon-midnight meridional plane
- Z = 0 – equatorial plane
- X = -15 R_E – cross-tail cut

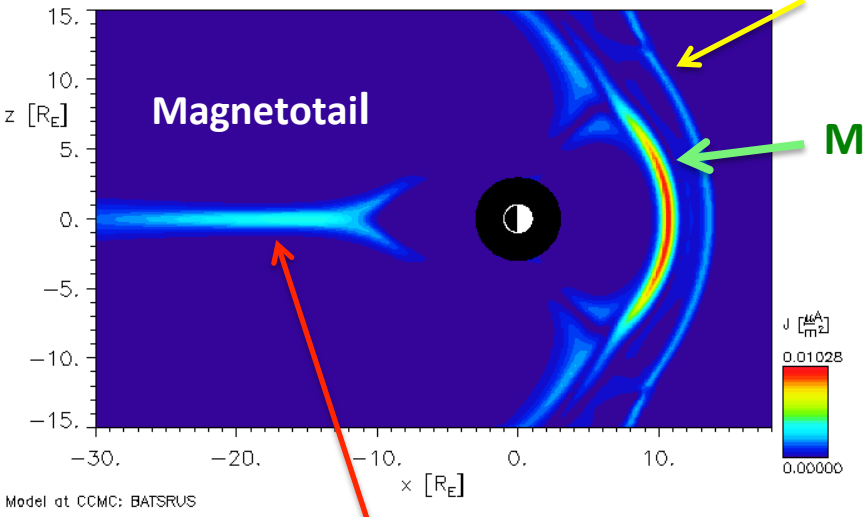
Choose Plot Area: Zoom-in to the area of interest

Click "Update Plot"

Color Contour Plots of Current Density (J) in Different Cut Planes

meridional cut Y=0

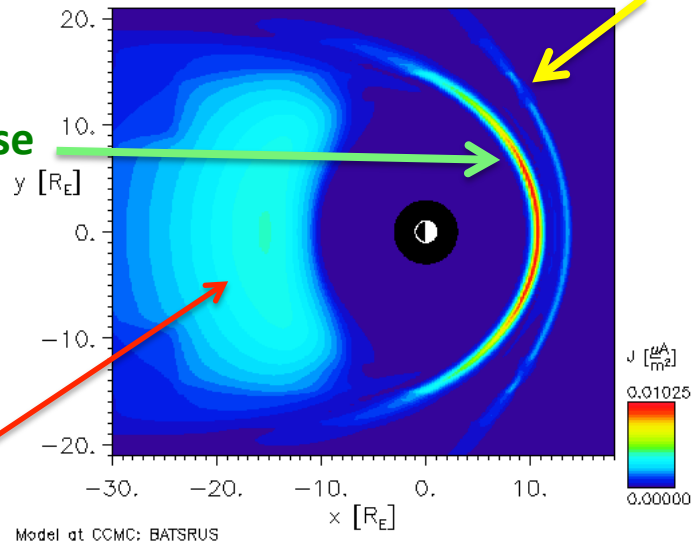
Bow shock



Magnetopause

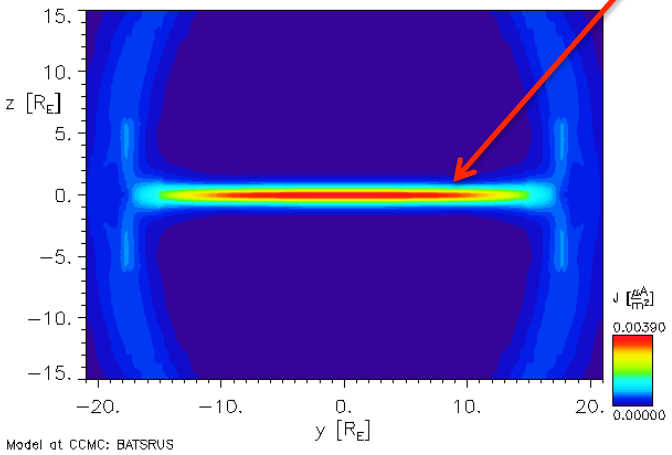
equatorial cut Z=0

Bow shock



Magnetotail current sheet

cross-tail cut X= -15 R_E



Example: Color+Vector+Flowlines Plot Mode

Plasma Pressure, Velocity Vectors, Magnetic Field Lines

Choose Plot Mode: **Color+Vector+Flowlines**
Choose Physical Variable for Color (Q1 menu): **P (pressure)**
Choose Physical Variable for Vector (Q2 menu): **any component of the velocity vector (V_x, V_y or V_z)**
Choose Physical Variable for Flowlines (Q3 menu): **any component of the magnetic field vector (B_x, B_y or B_z)**
Choose Cut Plane: **Y=constant=0**
Choose Plot Area: **X_1=-25, X_2=15, Z_1=-15, Z_2=15**

Update Plot *Update Plot* will update (generate) the plot with the chosen time and plot parameters below.
This will take some time (typically 10-30s) as data is read in and processed.

Modify Plot Options
Set flow lines thickness to 3

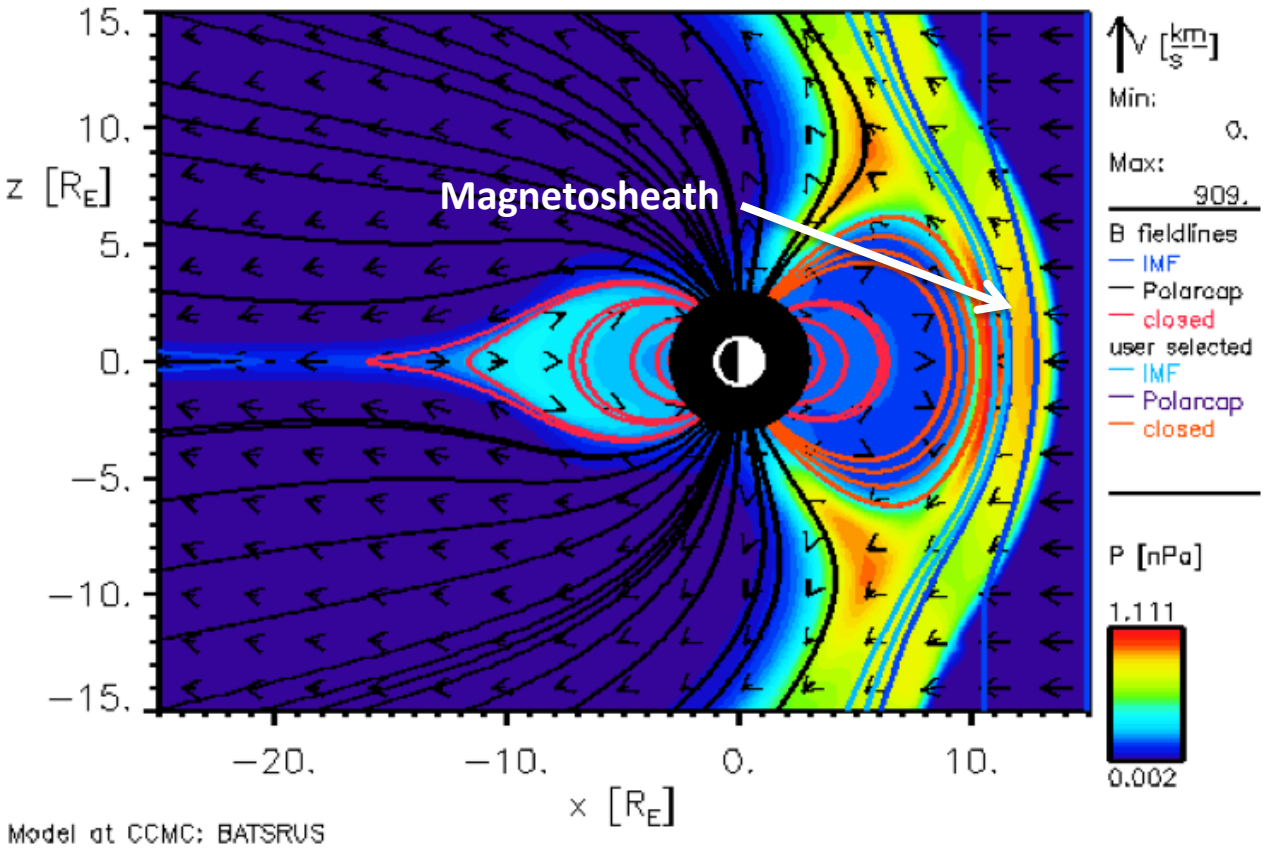
Choose data time:
Date: 2000/01/01 Time: 02:00:00

Plot Options:
☑ **Exclude region around the Earth** up to 3
R_E
Image magnification 1
(all images; use >=1.25 for 3D Flowlines)
Line thickness 3 (flow lines, arrows)

Click "Update Plot"

Example: Color+Vector+Flowlines Plot Mode (Results)

Plasma Pressure, Velocity Vectors, Magnetic Field Lines,



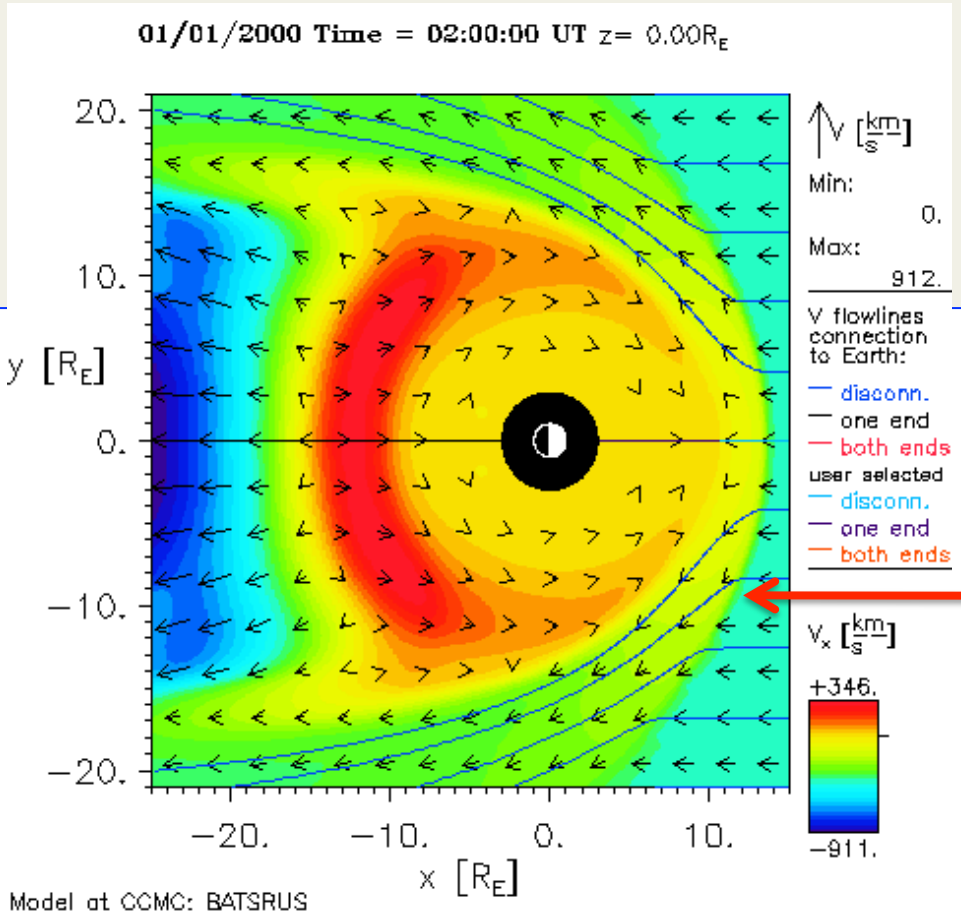
Red lines (closed): Magnetic field (MF) lines with both ends connected to the Earth
Black lines (open): MF lines with only one end a the Earth
Blue lines (interplanetary): MF lines with both ends in the interplanetary space

Example: Color+Vector+Flowlines Plot Mode

V_x Velocity Component, Velocity Vectors, Velocity Flowlines

Choose Plot Mode: **Color+Vector+Flowlines**
Choose Physical Variable for Color (Q1 menu): **V_x (X-component of velocity)**
Choose Physical Variable for Vector (Q2 menu): **any component of the velocity vector (V_x, V_y or V_z)**
Choose Physical Variable for Flowlines (Q3 menu): **any component of the velocity vector (V_x, V_y or V_z)**
Choose Cut Plane: **Z=0**
Choose Plot Area:
X_1=-25, X_2=15, Y_1=-21, Y_2=21

Click "Update Plot"



Bow shock

Example: Line (1D) Plot Mode

Velocity, Current Density, and Number Density

Choose Plot Mode: **Line (1D)**
Choose 1st Physical Variable (Q1 menu): **V (velocity)**
Choose 2nd Physical Variable (Q2 menu): **J (current density)**
Choose 3rd Physical Variable (Q3 menu): **N (number density)**

Choose **Plot Mode:**
Line (1D)

Choose **quantity** to be displayed (some **Plot Modes** require up to three choices):
Q 1: V Q 2: J Q 3: N
Note: divergences, gradients and curls are not yet available with SWX plot modes.

Choose Cut Plane: **Z=0**
Choose start point of line: **X_1=7, Y_1=0, Z_1=0**
Choose start point of line: **X_2=14, Y_2=0, Z_2=0**

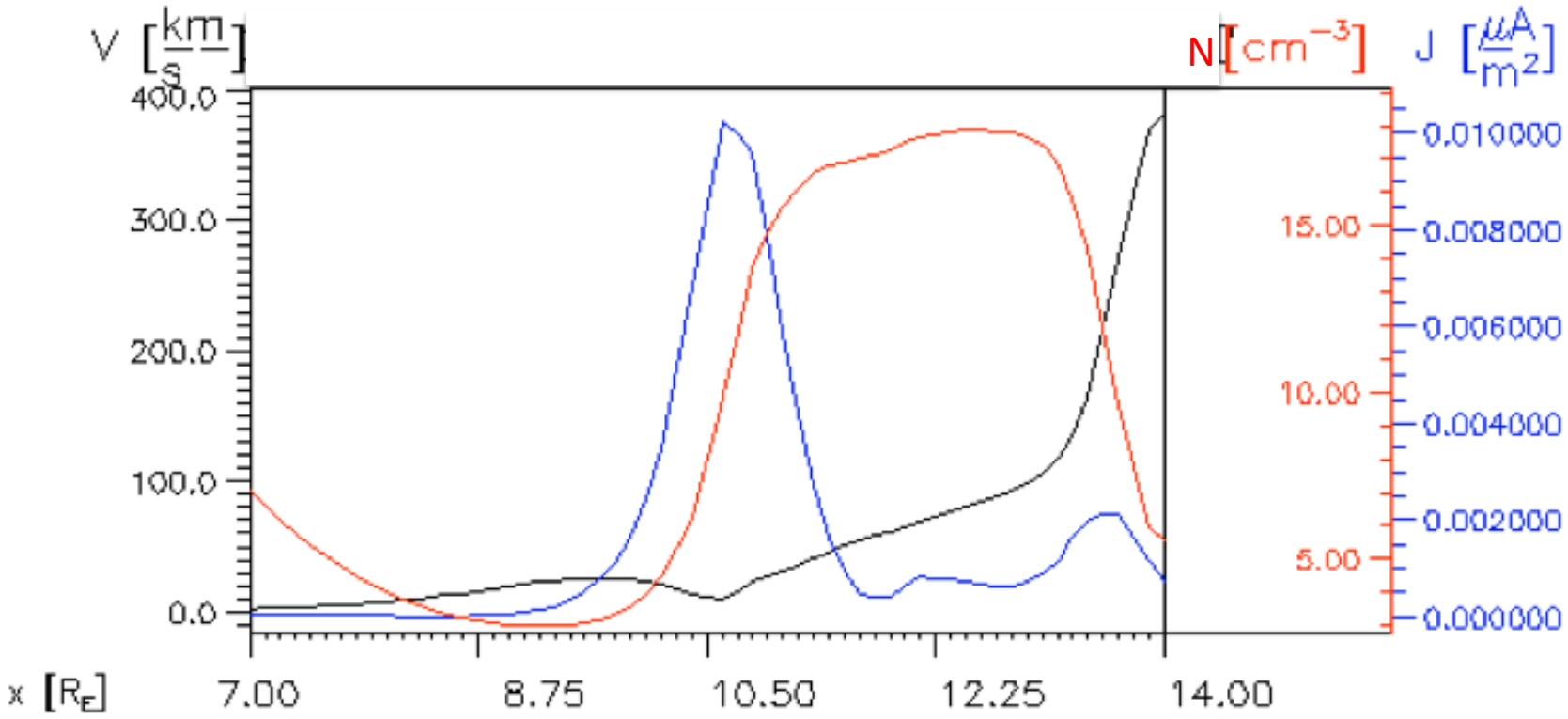
X_1	7	X_2	14	Range: -255 ... 33 R_E
Y_1	0	Y_2	0	Range: -48 ... 48 R_E
Z_1	0	Z_2	0	Range: -48 ... 48 R_E

Click "Update Plot"

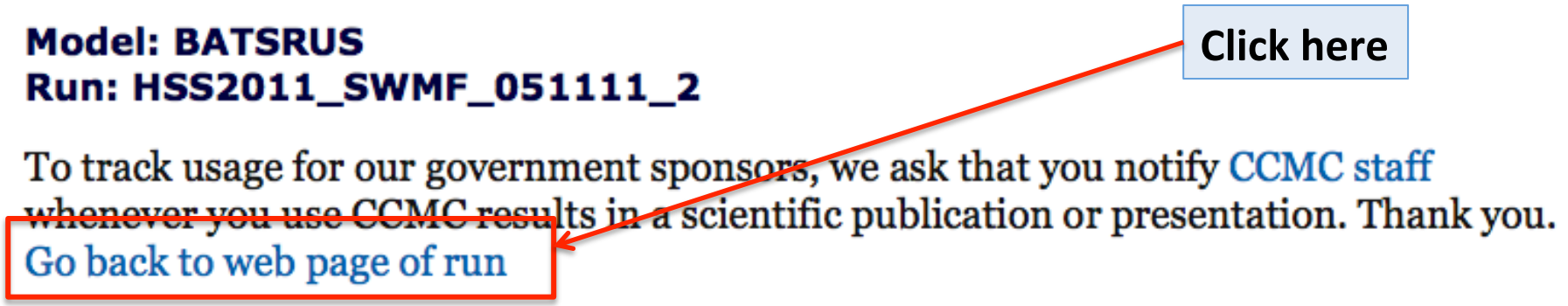
Example: Line (1D) Plot Mode (Results)

Velocity, Current Density, Number Density

Choose Plot Mode: **Line (1D)**
Choose 1st Physical Variable (Q1 menu): **V (velocity)**
Choose 2nd Physical Variable (Q2 menu): **J (current density)**
Choose 3rd Physical Variable (Q3 menu): N (number density)



Go Back to the Web Page of the Run



Visualize Ionosphere Electrodynamics (optional)

HSS2011_SWMF_051111_2

Title/Introduction:

Key Word: HS2010, equinox, quiet

3D MHD Model: BATSRUS
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Inflow Boundary Conditions: Fixed
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Dipole Tilt at Start in X-Z Plane: 0.0 deg.
Dipole Tilt in Y-Z GSE Plane: 0.0 deg.
Dipole Update With Time: no
Ionospheric Conductance: uniformp5,h0
No Corotation Velocity is Applied at The Inner Boundary.
Radio Flux 10.7 cm: 150.
Coordinate System for the Output: GSM
Initial Solar Wind (SW) Parameters in GSM Coordinates:

SW Density: 5.00 n/cc
SW Temperature [Kelvin]: 232100.00 Kelvin
X Component of SW Velocity: -400.00 km/sec
Y Component of SW Velocity: 0.00 km/sec
Z Component of SW Velocity: 0.00 km/sec
IMF Bx: 0.00 nT
IMF By: 0.00 nT
IMF Bz: -5.00 nT
IMF |B|: 5.00 nT
IMF Clock Angle: 180.0 deg.

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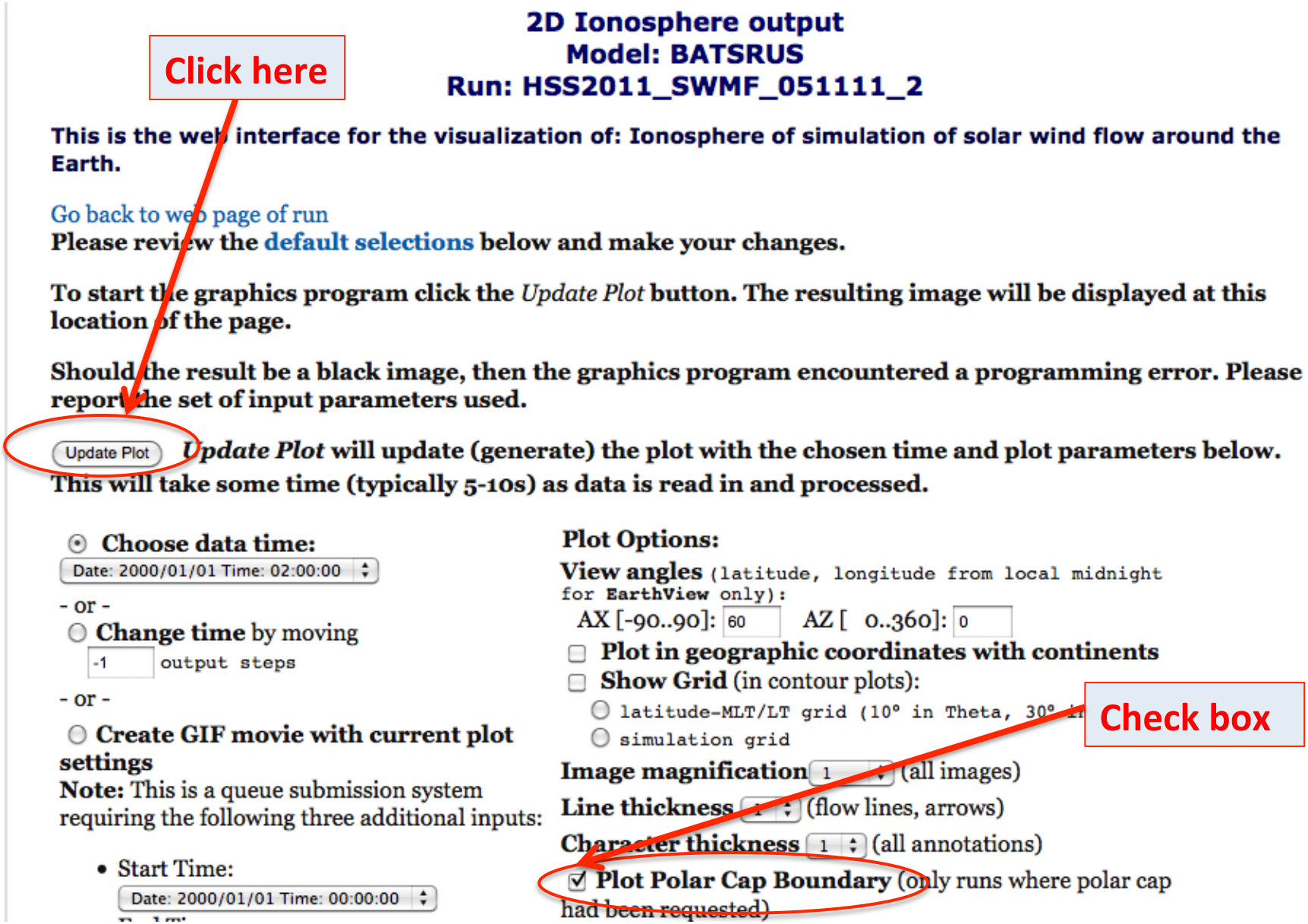
- View Polar cap boundary at 24 magnetic local times
- View Ionospheric dissipation Ring Current data:
- View Ring Current H+ ion data
- View Ring Current electron data

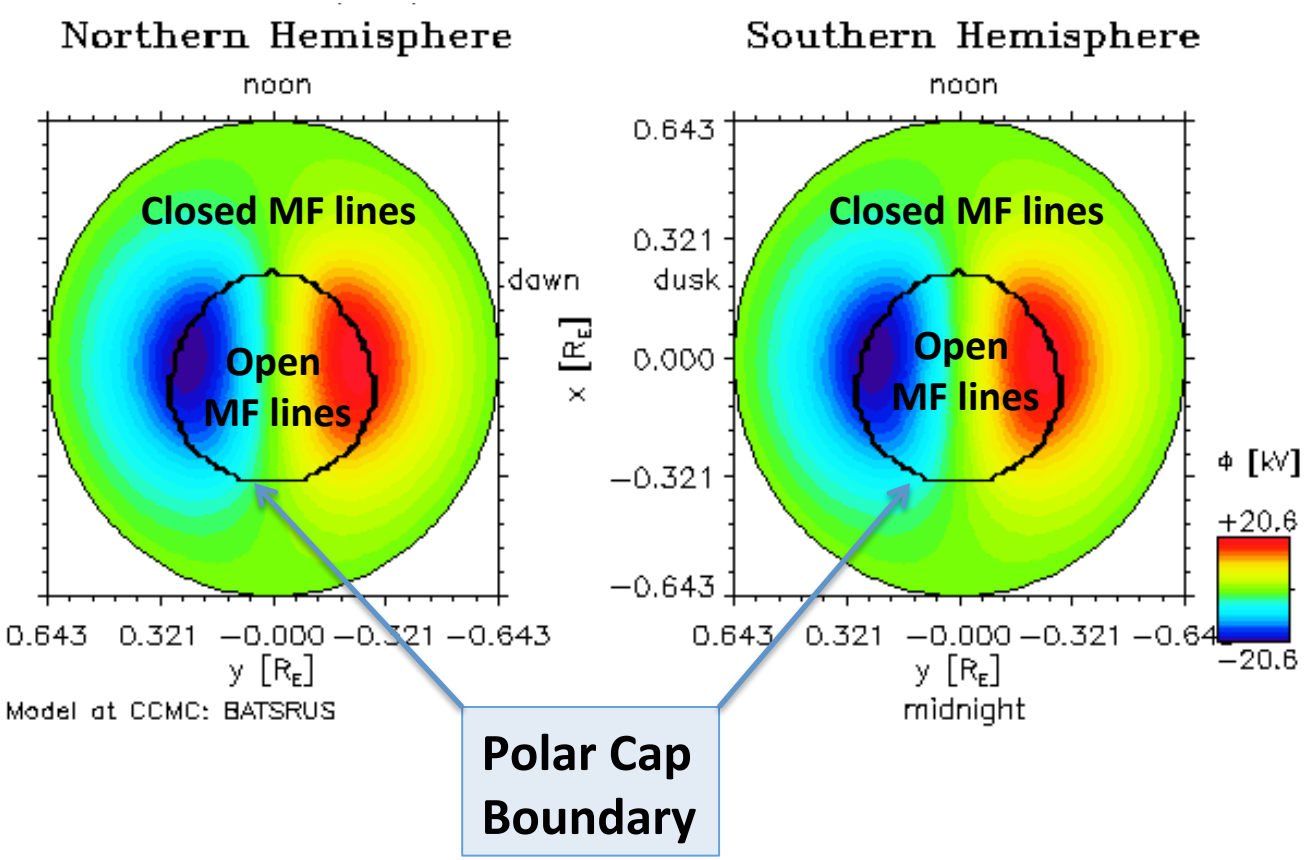
Field-aligned currents from the inner boundary of the magnetopshere domain (at about R = 3 R_E) are mapped along the magnetic field lines to the ionosphere (at about R=110 km). Ionosphere electrodynamics solver derives electrostatic potential at the R=110 km sphere and map it back to the magnetosphere

Click here

Make a Plot of Ionospheric Potential with Polar Cap (Default Selections)



Ionospheric Potential with Polar Cap (Results)



Closed: Magnetic field (MF) lines with both ends connected to the ionosphere
Open: MF lines with one end connected to the ionosphere and another end to the interplanetary space