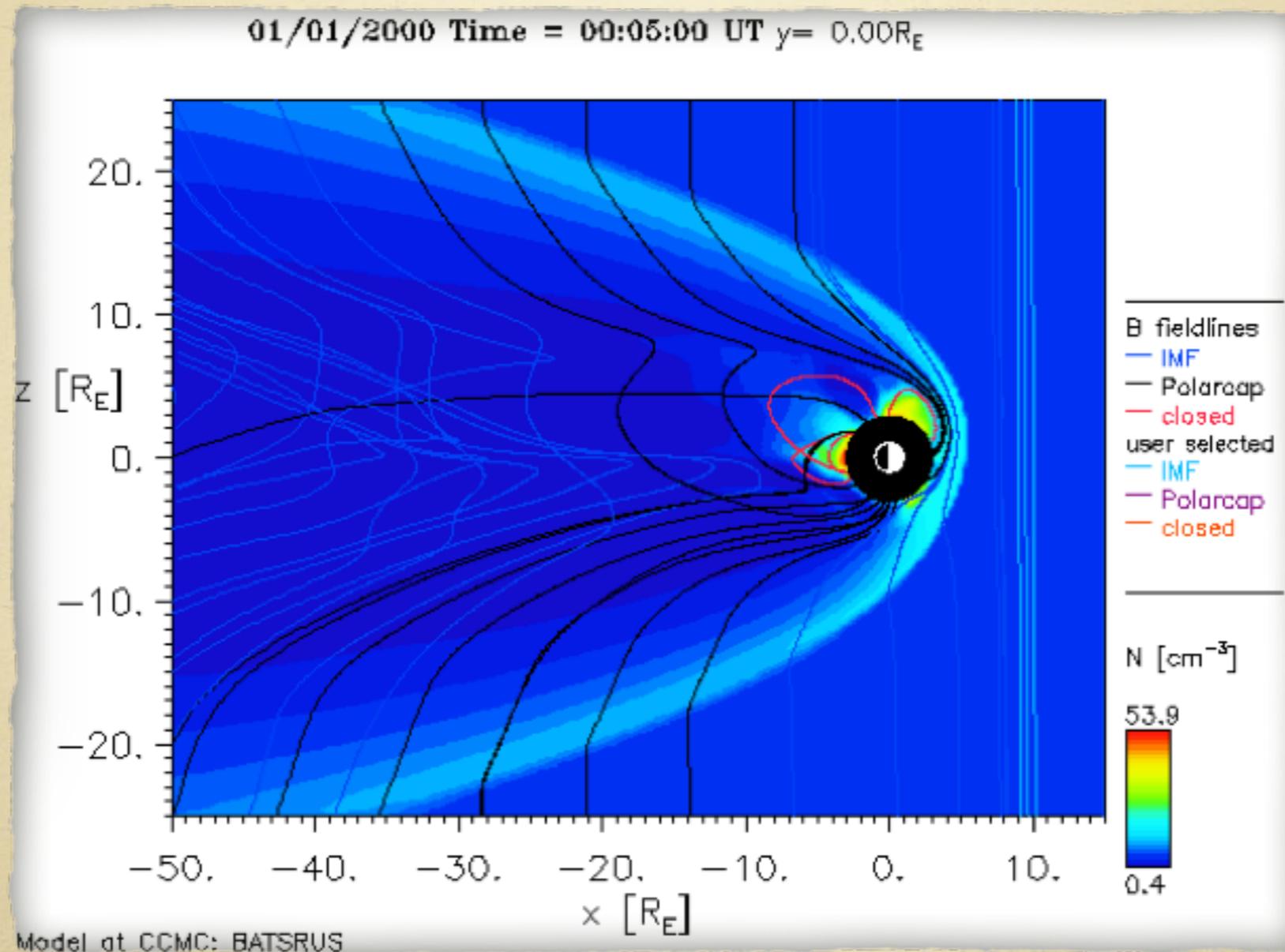


Comparative Magnetospheres



Nicholas Gross, Boston University

Jan Sojka, Utah State

Masha Kuznetsova, CCMC

Active Learning Environments

- CCMC Supports Active Learning at the (LWS) Heliophysics Summer School
 - iSWA Access to historical models and observations (SOHO)
 - Global Structure of the Solar Wind at Solar Min and Max
 - Comparative Magnetosphere Runs
 - Comparative Ionosphere Runs
- CCMC Education Page
 - <http://ccmc.gsfc.nasa.gov/support/>
 - manuals available there

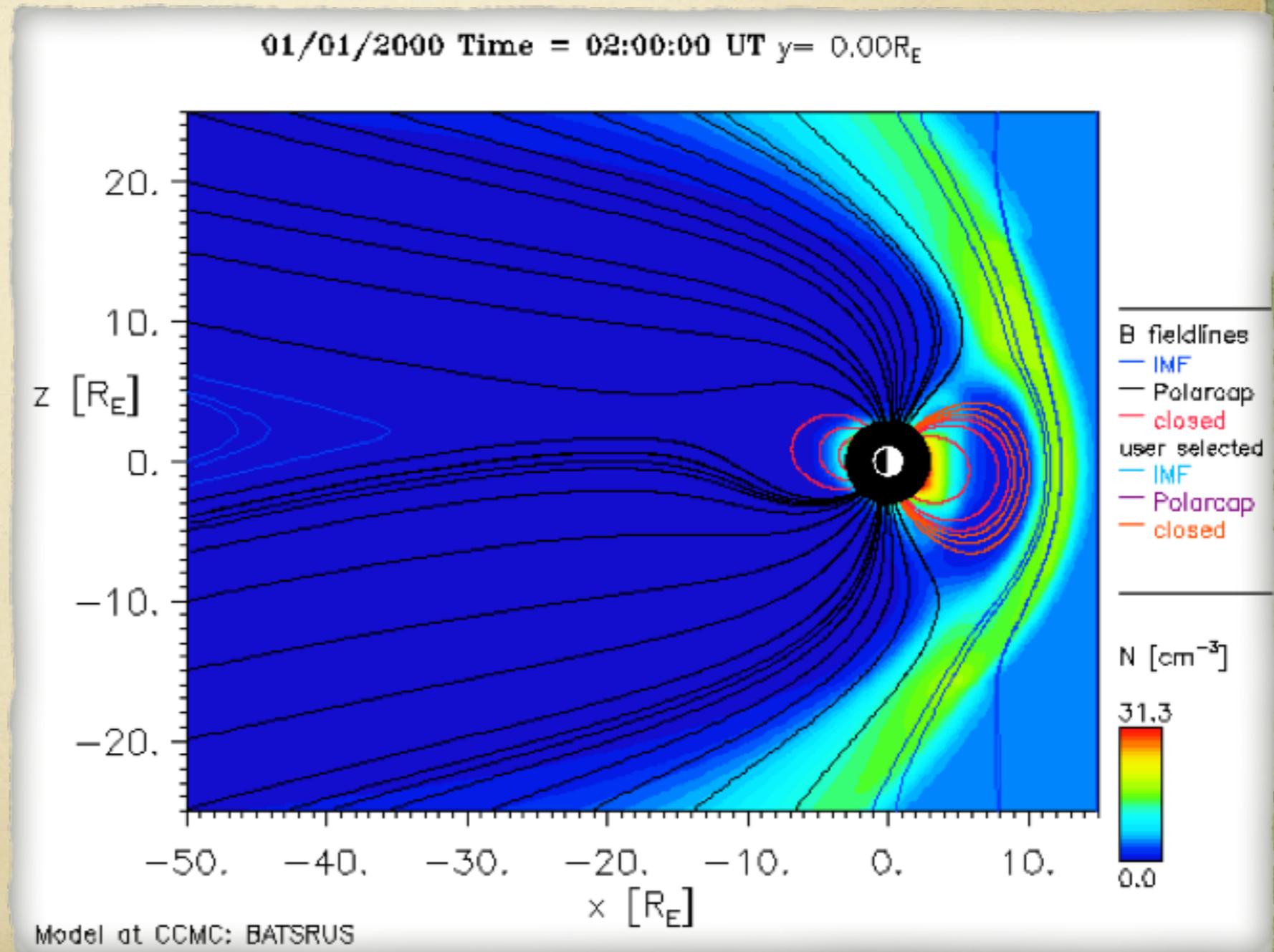


Comparative Magnetospheres

- Dipole Strength
- Location in the Heliosphere
- Dipole Tilt
- Dipole reversal
- [http://ccmc.gsfc.nasa.gov/support/HSS_2015/
consolidated.php](http://ccmc.gsfc.nasa.gov/support/HSS_2015/consolidated.php)

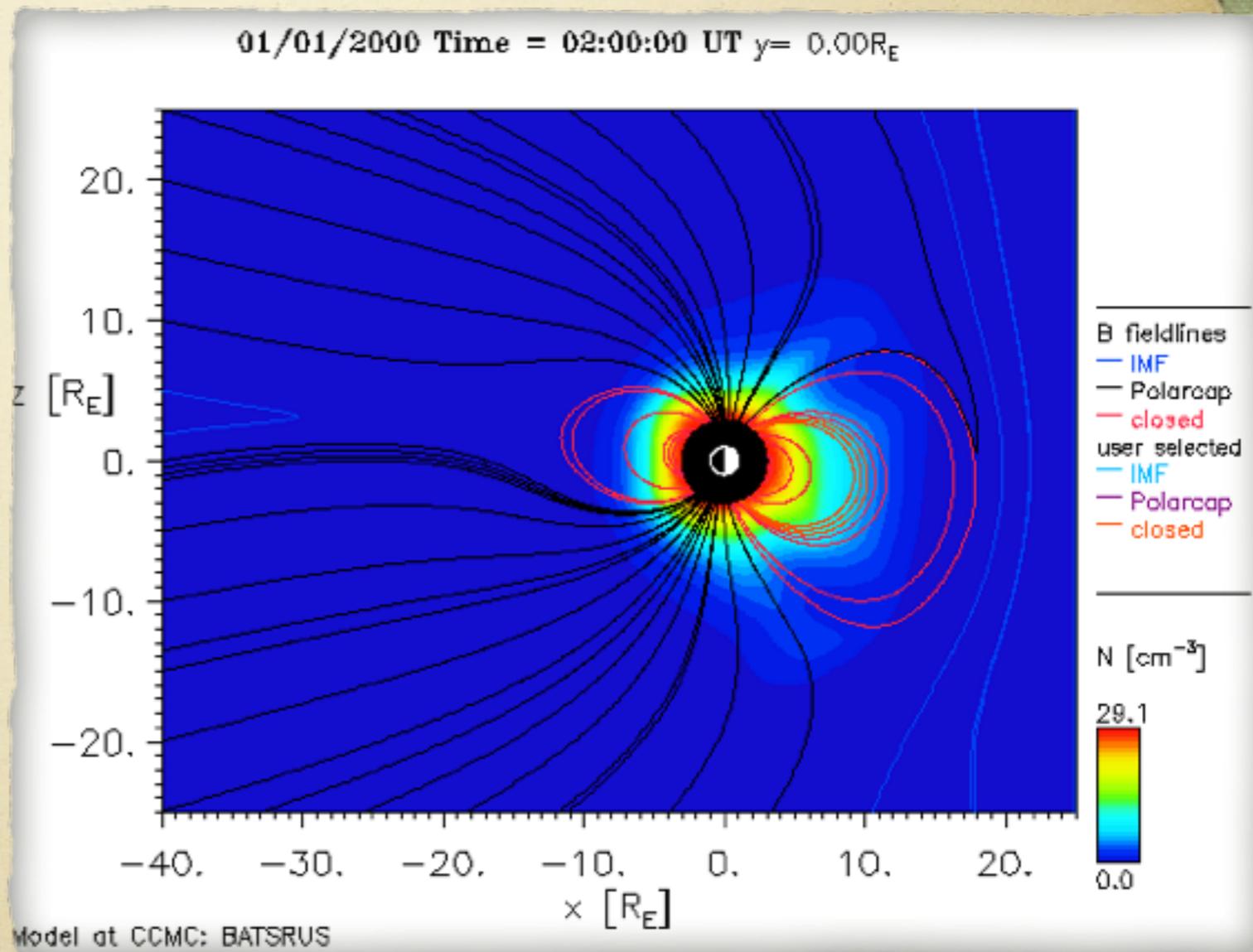
Magnetosphere Basics

- Bow Shock
- Magnetopause
- Cusp Region
- Inner Magnetosphere
- Tail/ current sheet
- X-points



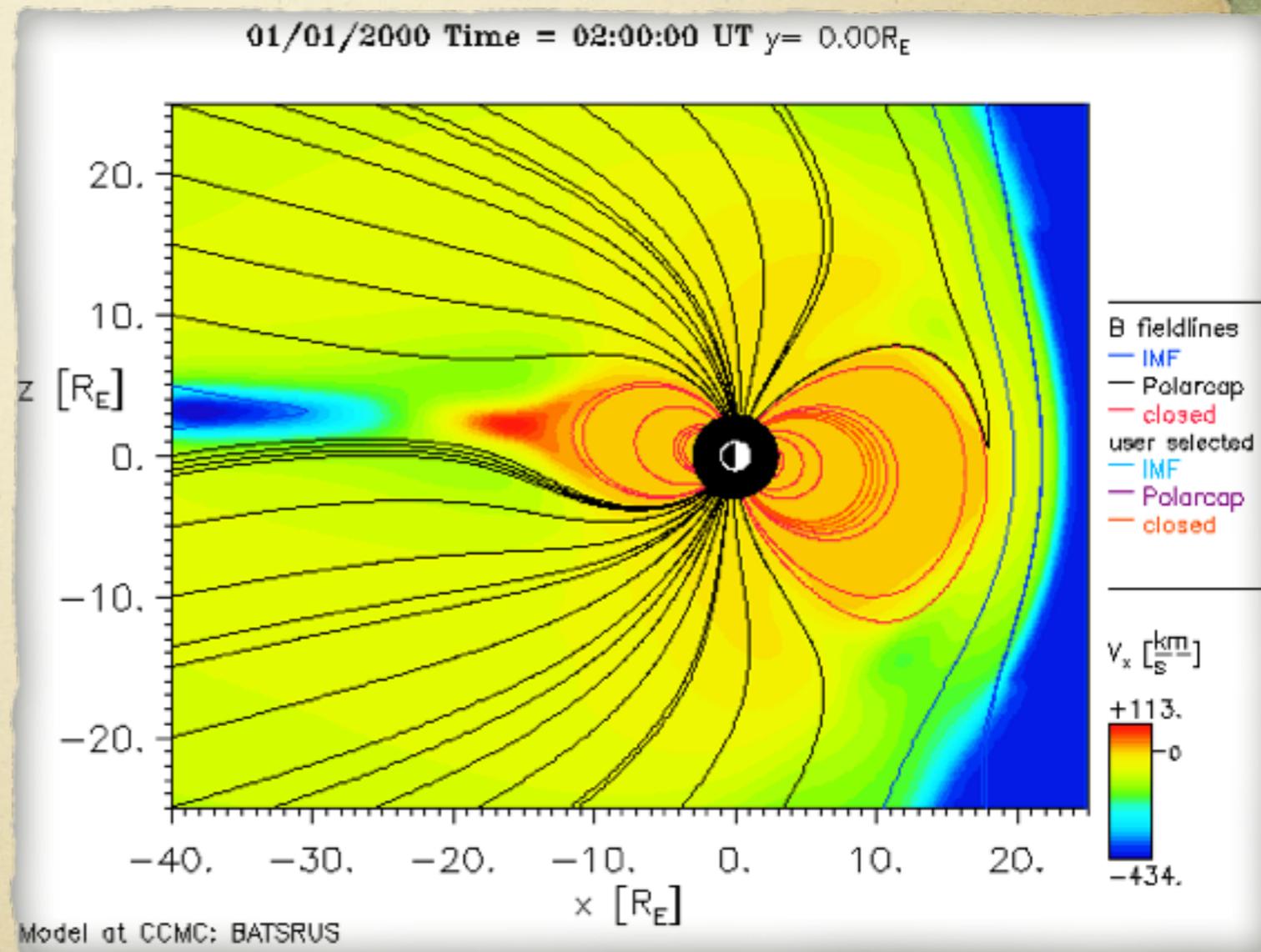
Magnetosphere Location

- Vary Solar Wind parameters to indicate distance from the Sun
- (0.3, 0.6, 1, 2, 5 AU)
- Fits prediction of stand off distance pretty well ($r^{-1/6}$?)
- Builds on Solar Wind Lab Results



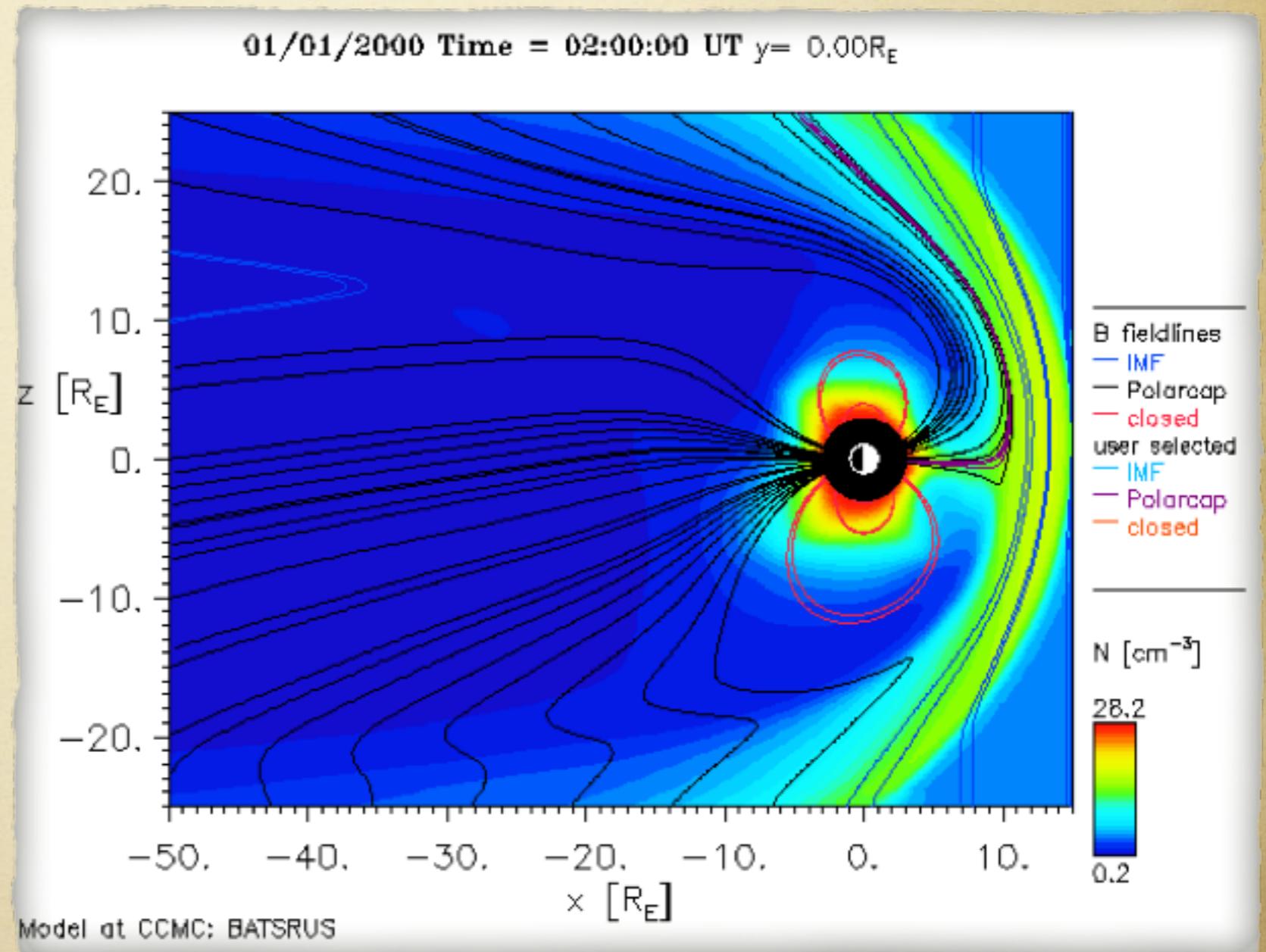
Magnetosphere Location

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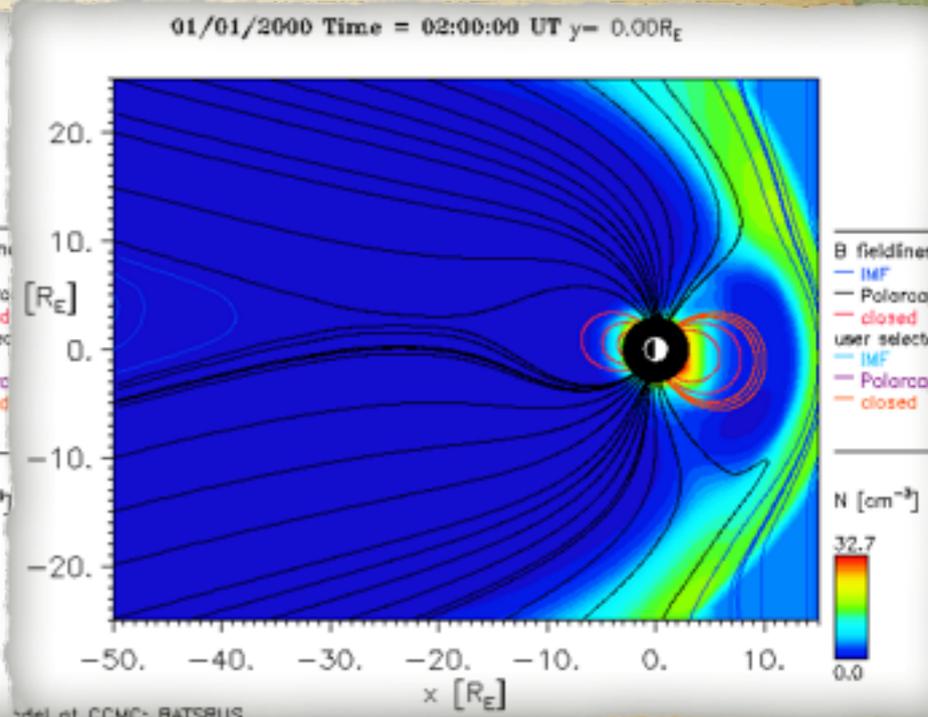
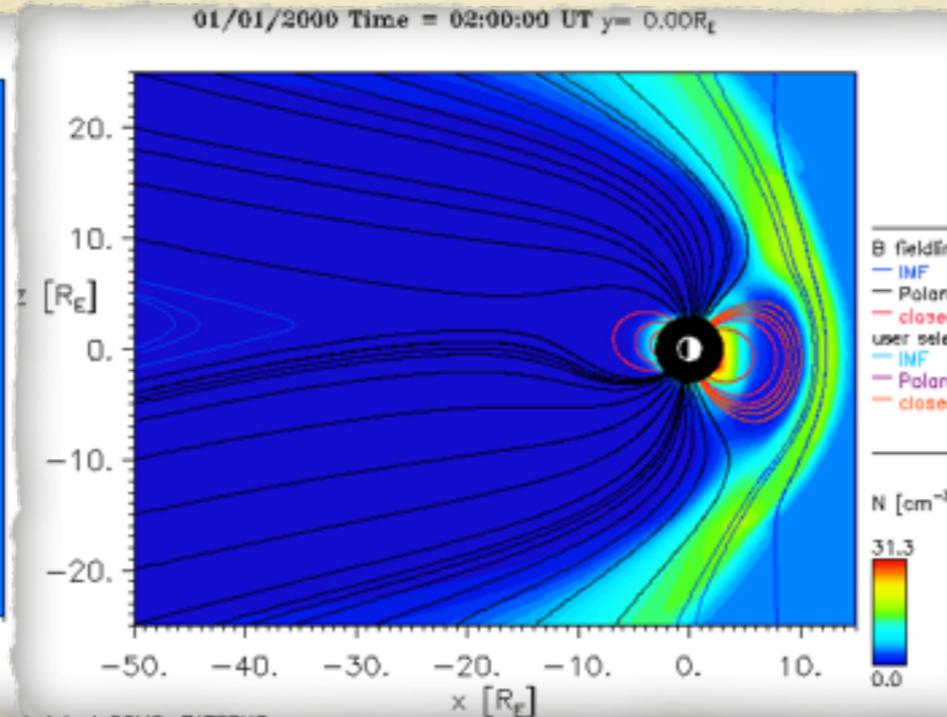
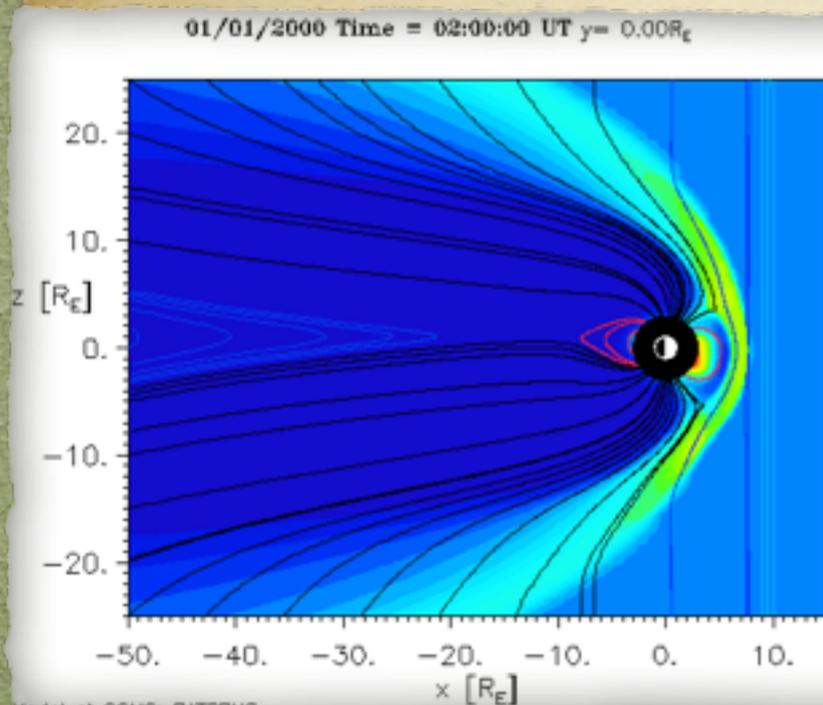
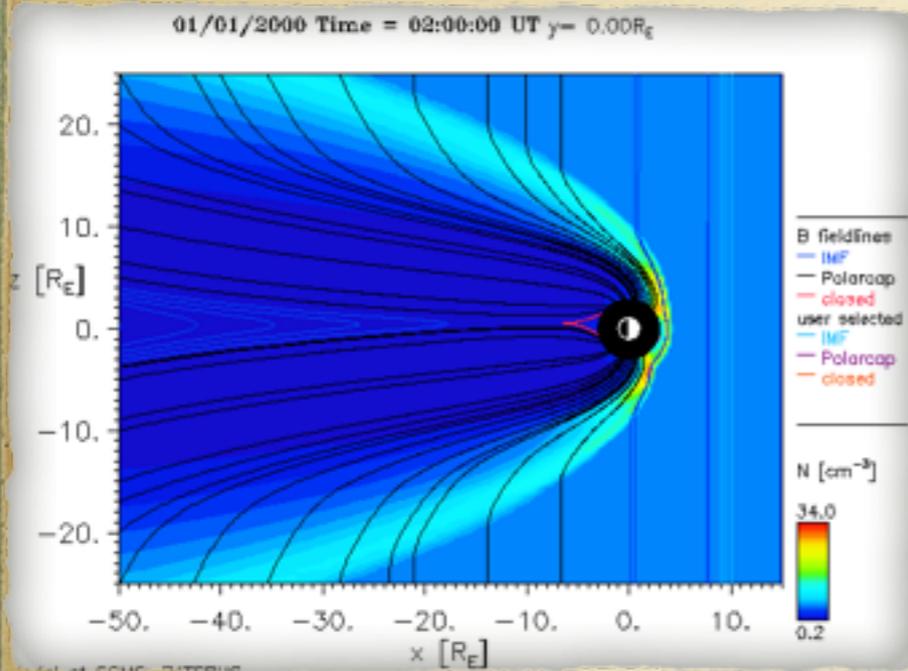
Dipole Tilt

- Varying Dipole Tilt
- $0^\circ, 11^\circ, 45^\circ, 90^\circ$



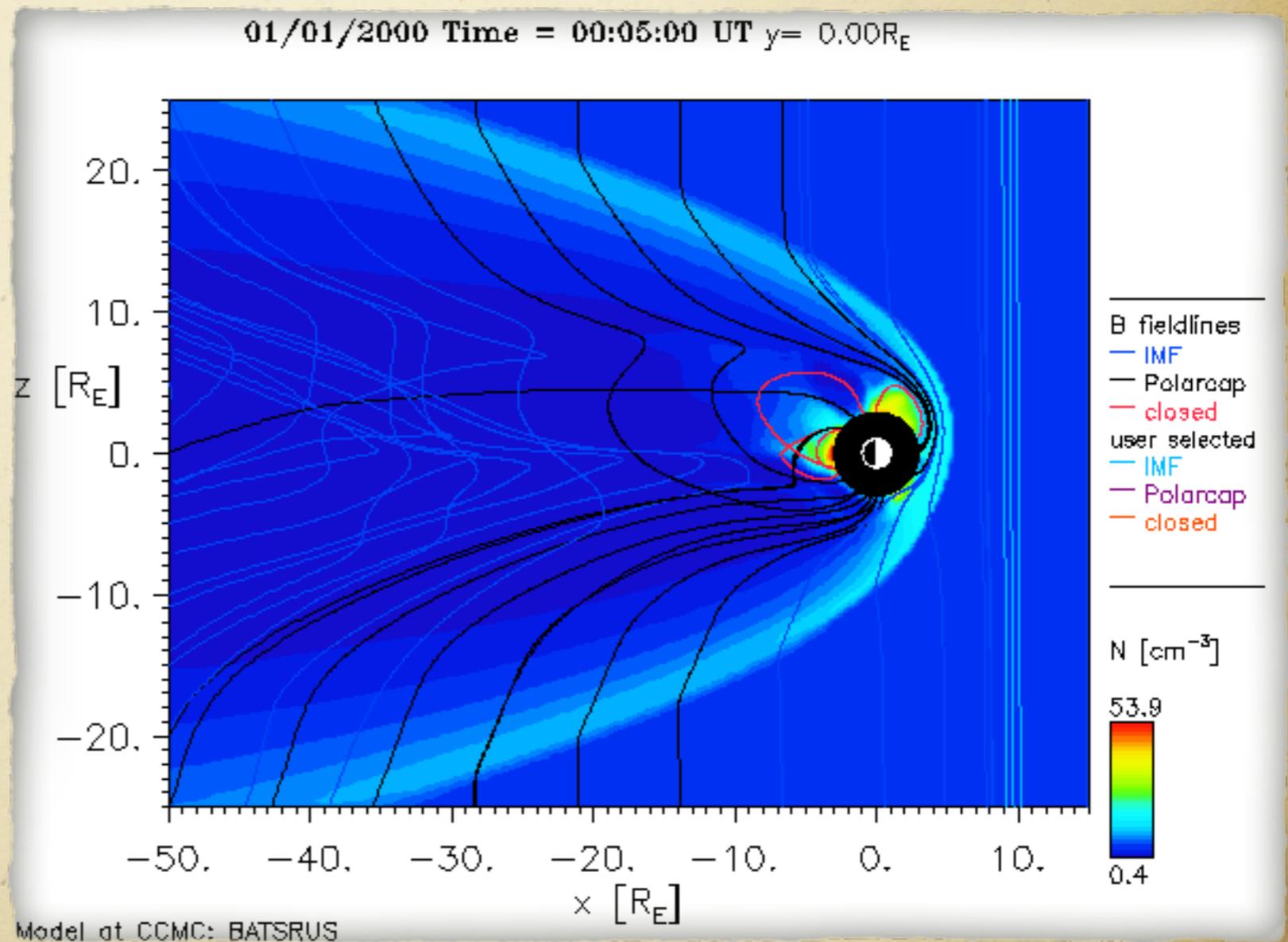
Dipole Strength

- Varying Dipole Strengths
- Fits prediction of stand off distance pretty well
- 0.05, 0.2, 1.0, 2.0 DM_E



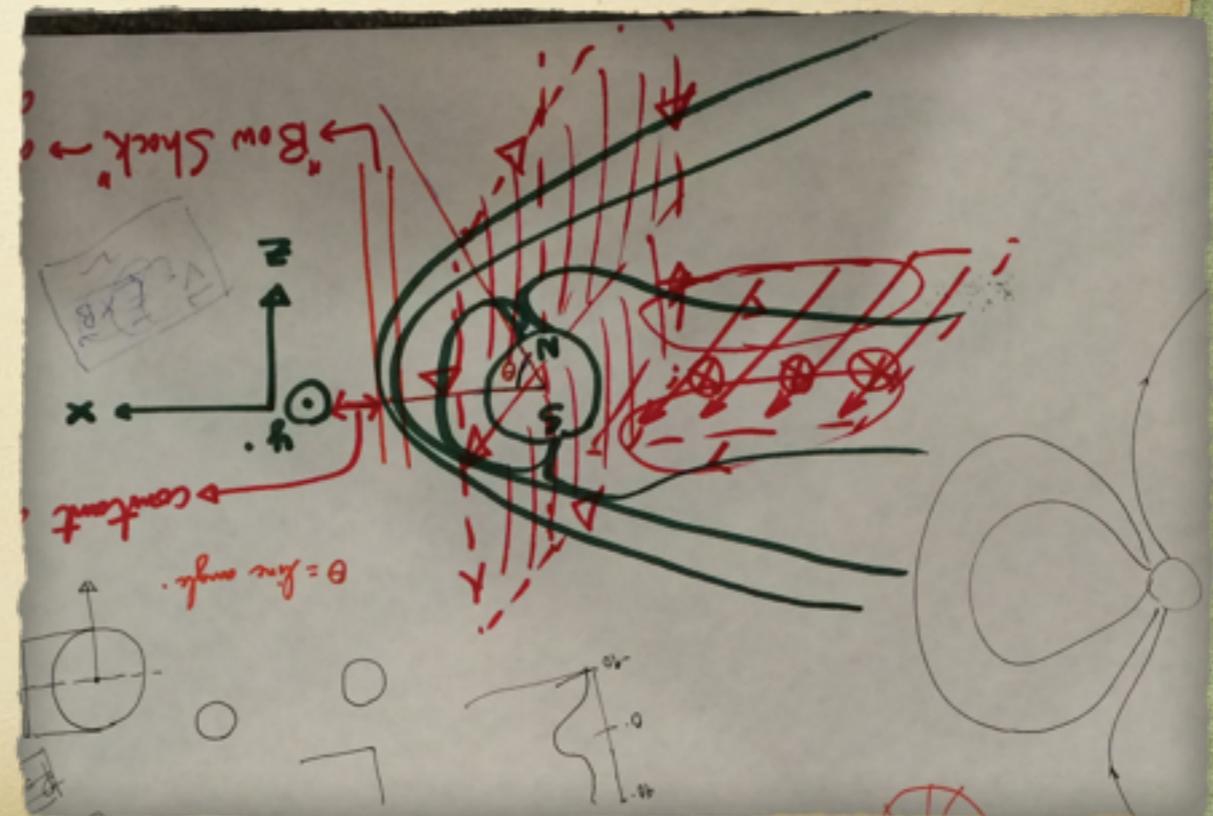
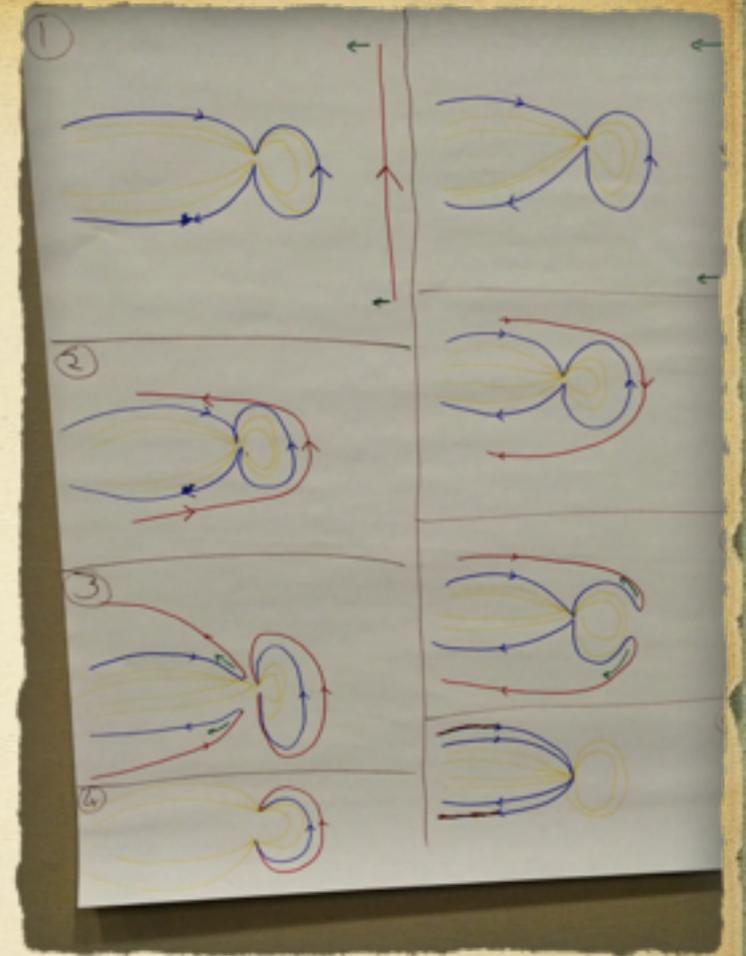
Magnetosphere Dipole Reversal and Higher Order Moments

➤ Glatzmaier et al. (1999)
Nature 401, 885-890



Lab Activity

- Each Group Familiarizes itself with the Magnetosphere Basics
- Different Groups explore “What if?” scenarios
- Groups report out their findings at the end and suggest future work



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