S-RAMP(STEP Results, Analysis and Modeling Phase) Database in Japan

Simulation/Modeling (SRAMPDB-J-SM0001)
*Version 1.0  November 1998*

3-Dimensional MHD Simulation of Solar Wind - Magnetosphere Interaction and Modeling of Magnetosphere - Ionosphere Coupling Precesses

1. QuickTime Movie for Simulation/Modeling

The QuickTime movie files, which were obtained by means of computer simulation and modeling, are presented in this CD-R. The computer simulation was created by T. Ogino and the computer modeling by Dr. J.-H. Shue and Prof. Y. Kamide.

The movie files in movie 1, movie 2, and movie 3 formats represent simulation/modeling for the January 1997 events (1/10/1997-1/11/1997), when magnetospheric storms occurred on 1/10 and the solar wind had a very high density. $Nsw$ = 185 /cc with a northward interplanetary magnetic field (IMF) and $Bz$ = 18.2 nT. Ionospheric currents were calculated using an inverse method (KRM method) when data from observations of the geomagnetic

field was used for the calculation. A three-dimensional global magnetohydrodynamic (MHD) simulation of the interaction between the solar wind and the Earth's magnetosphere was presented for the high density solar wind and northward IMF.

The three-dimensional MHD simulation for the IMF rotation is also presented in a polar plot format, with three-dimensional magnetic field lines, cross sectional patterns, and reconnection sites.

Moreover, the MHD simulation results with high spatial resolution are demonstrated every 30 seconds when the IMF changes its orientation to the north-south direction.

These QuickTime movie files can be viewed by a large number of people from workstations and personal computers. We are pleased to provide them for your enjoyment.

Thank You,

November, 1998 Tatsuki Ogino Solar-Terrestrial Environment Laboratory Nagoya University

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and Culture. Computing support was provided by the Computer Center of Nagoya University and by the San Diego Supercomputer Center.

2. Structure of QuickTime Movie Files:

QuickTime movie files

movie1 1997 January events (Test)

| | |
|---|---|
| krm10.mov | (Shue & Kamide) |
| mp10.mov | (Shue) |
| mp11.mov | (Shue) |
| z25e02b1.mov | :polar plot |
| z482e02b1.mov | :magnetic field lines |
| zt22e02b1.mov | :cross section |
| z23nws1.mov | :cross section |
| z23swn1.mov | :cross section |

movie2 1997 January events (GOIN98 Demo at NCAR)

| | |
|---|---|
| 10krm.mov | (Shue & Kamide) |
| 11krm.mov | (Shue & Kamide) |
| krm10a.mov | (Shue & Kamide) |
| krmgoin98.mov | (Shue & Kamide) |

mp10a.mov (Shue)
mp10a.mov (Shue)
z25e1010nw.mov :polar plot
z25e101cnw.mov
z25e102026.mov
zt221010nw.mov :cross section
zt22101cnw.mov
zt22102026.mov
z4821010nw.mov :magnetic field lines
z482101cnw.mov
z482102026.mov

movie3 1997 January events (GOIN98 Demo at Tsukuba)

me1b102027.mov
me1b102c12.mov
me1b102d14.mov
me1b102d67.mov
me1b102e16.mov

movie4 3D MHD simulation

solar wind-magnetosphere interaction
IMF rotation (transient phenomena)
z25efcc.mov :polar plot
z480fcc.mov :magnetic field lines

z482fcc.mov :magnetic field lines
zz22fcc.mov :cross section
zz33fcc.mov :reconnection site
z25efcd.mov :period with 480 min
z480fcd.mov
z482fcd.mov
zz22fcd.mov
zz33fcd.mov
z25ega.mov :change of period
z480ga.mov
zz22ga.mov
zz33ga.mov

movie5 3D MHD simulation
solar wind-magnetosphere interaction
IMF rotation (steady state)
z25eerota.mov :polar plot
z480erota.mov :magnetic field lines
z482erota.mov :magnetic field lines
zz22erota.mov :cross section
zz33erota.mov :reconnection site
z25eerotb.mov
z480erotb.mov

z482erotb.mov
zz22erotb.mov
zz33erotb.mov

movie6 3D MHD simulation for IMF changes

| | |
|---|---|
| z4201a.mov | :t=180-300 min |
| z4202c.mov | :t=300-420 min |
| z421at.mov | :t=300-360 min |
| z423a1.mov | :t=360-420 min |
| z423a7.mov | :t=420-480 min |
| z423ad.mov | :t=480-540 min |
| z423aj.mov | :t=540-600 min |
| z423ap.mov | :t=600-660 min |

juipter 3D MHD simulation for Jovian magnetosphere

gifmovie gif movie files

| | |
|---|---|
| homepage | :movie files at homepage |
| rotation | :IMF rotation for earth's magnetosphere |

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