



Ring Current coupling with Magnetosphere / Ionosphere

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Space Environment Modeling
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Which Models?

- ◆ Fok's Ring Current Model
- ◆ BATS-R-US
- ◆ UCLA/GGCM

Problem Definition

- ◆ One-way coupled system
- ◆ All codes in Fortran (77/90)
- ◆ Data transfer with write to disk
- ◆ As always – coordinate conversions and data interpolation

Parameters Passed

- ◆ IMF for run duration
- ◆ Magnetic Field data to Ring Current Cartesian SM grid
- ◆ Ionospheric Potential with grid information
- ◆ Temperature and Density in equatorial plane

Cadence

- ◆ B, V, T, and Potential in equal time-steps
 - Matches the MHD/Ionosphere timing
 - Cadence information provided via text file
- ◆ IMF - 4 minute intervals or less
 - Provided with time/date information
 - Time-steps may be irregular

Coupling Structure

- ◆ Fortran 90
- ◆ Reusable, not plug-n-play
 - Interfaces cater to models
- ◆ Currently a post-processing scheme

Lessons Learned

- ◆ Good data description is a MUST
- ◆ Coordinate conversion
 - Is Geopack good enough?
 - How sensitive are the models?
- ◆ Interpolation schemes
 - Again ... what's 'good enough'?
 - Can these issues be resolved in a generic framework?