Current Users

- 1. Unifying theme was an appreciation of CCMC staff for their efforts to assist (All).

- 2. Magnetospheric models powerful tools providing results that immediately translate into discoveries and research papers (Siscoe).

- 3. IT services are impressive. Can compare with observations to determine what features models have to work on more. (Mannucci)

Current Users

- 4. Suggestions
  - a. Continue your efforts to couple models, e.g. magnetosphere/ionosphere to thermosphere (Siscoe, Mannucci)
  - b. Need for enhanced user-provider contacts to enhance flexibility and user control in solar/heliospheric models to the levels available for magnetospheric models (Luhmann, Devore-A, Mannucci).
  - c. Continue STEREO support (Luhmann, Devore-A)

Current Users

- 4. Suggestions (con)
  - d. Provide read me files to accompany output downloads (Devore-A)
  - e. Integrate model coronal densities for comparison with coronograph images (Devore-A)

New Models

- 1. **Dikpati**- solar dynamo models. Flux transport dynamo: generation of toroidal field by shearing poloidal field, regeneration of poloidal field by lifting and twisting a toroidal flux tube by helical turbulence. Flux transport by meridional circulation.

- Predicts surface radial and toroidal fields for comparison with observations of photospheric fields.

- Predict peak amplitudes of solar cycles 12 through 24 with flux transport dynamo model. Based on memory of magnetic field.

- Trying to predict Maunder minimum.

New Models

– 2. **George Fisher (given by Janet Luhmann)**

- ANMHD solve 3D MHD equations to study subsurface evolution, convective dynamo, magnetoconvection, active region formation
- FLCT uses local correlation tracking to determine spatial displacements of image structure.
- AMPS. 3D MHD equations to study solar magnetic field from convection zone to corona.
- Developing SANMHD. 3D MHD in spherical geometry.

New Models

- 3. **Solomon**

- Models. TIE-GCM, TIME-GCM, WACCM big models.

- AMIE, GLOW, CMIT, GSWM, CAM3, WRF

- TIE-GCM. Thermosphere ionosphere. Solar flux, solar energy deposition, auroral forcing, tidal oscillations, code engineering.

- TIME-GCM Includes mesosphere. Flux couple to lower atmosphere.

  - WACCM. TIME GCM + MOZART OZONE, CAM3 community atmosphere. Presently available through portal at NCAR, but not with a user-supplier mentality

New Models

- 4. **DeVore**. ARMS for the CCMC (not a call for defensive measures)
  - Time dependent MHD equations in 3D in dynamic block adaptive grids. Heliospace display package.
  - Grid: cartesian, cylindrical spherical. Boundaries: periodic, symmetric. Grid adaptive.
  - Dynamic remeshing.
- Transitioning. Ready to provide code to CCMC, but this is a complex research tool, run on demand or pre-operational model. Expert assistance neeed. Would have to constrain user inputs. Provide sample runs. Offer steady state inner coronal models to others.

New Models

- 5. **Zank**

- Heliopause, Termination Shock, Bow Shock, neutral Hydrogen wall
  - Must include neutrals, charge-exchange interactions, a mechanism for anomalous heat transport.

- Self-consistent models;
- Dynamic plasma and neutrals: four-fluid model
- Monte-Carlo Boltzmann, particle Boltzmann (kinetic)

- Kinetic and multi-fluid approaches are converging.

- Solar wind anisotropy, 2D vs 3D heliosphere, tilted dipole, wavy current sheet. Time dependence solar cycle, solar wind disturbances. Galactic cosmic rays.

- 2D codes ready for CCMC. Boltzman and Kinetic treatments.