V&V Session Summary

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Solar-Helio Models (MacNeice): WSA, WSA-ENLIl, +Cone

- Establish validation program that is *generally applicable*, long-term metrics (~30 yrs)
- Parameters of interest: v_{sw} and B_r, persistence and event
- WSA as baseline model
- Skill score on persistence and event detection
- Comparison across studies is hard (Owens vs. McNeice) data selection
- WSA vs. WSA ENLIL comparable in skill score

Solar-Helio Models: Cone

- Parameters of interest: CME arrival time, impact (ram pressure, standoff distance)
- WSA/ENLIL cone better in arrival time than an existing parametric model
- But: WSA/ENLIL cone overestimates impact parameters
- To do list: V&V for MAS/CORHEL and coupled models, SEPs etc.

Discussion

- Zoran: How can V&V be made useful for model developers? (close misses of current sheet at 1AU)
- Aaron: Blind metrics useful for comparisons only (as simple skill assessment

- My take: standardized skill scores can be used to measure progress of investment in grant programs (as requested by admin.)

Magnetosphere/Ionosphere Models (Pulkkinen)

- CCMC carries out *independent* V&V

Inner Magnetosphere:

- Fok Ring current model: Predicted fluxes high, fine-structure problematic, Room for improvement (persistence scores higher than model)
- Compreh. RCM BATS-R-US closer to IMAGE observations than coupled Fok BATS-R-US model

Inner Magnetosphere: GICs

- Auroral component not captured in all models

Ionospheric V&V

- DMSP vs. BATS-R-US Poynting flux forecasts (comparison via Joule heating) good qualitative agreement

Geomagn. Index, SW propagation from L1

- RDst (Eccles) model vs. observations
- Coherence of propagated SW, 3 propagation techniques (Weimer&King etc.), all equivalent

Discussion

- Therese: Pulkkinen event approach with limited number of time periods vs. long-term V&V in MacNeice

2008-2009 GEM challenge

- Quantify model performances
- Modelers send simulations into metrics interface, CCMC carries out metrics analyses
- Parameters of interest: geostationary and ground magnetic disturbances
- Results will be reported in SWJ
- MHD better in predicting spectral characteristics, empirical models better at forecasting main features

CCMC Support of GEM Activities (Sazykin)

- GEM: 5 research areas: dayside magn., inner magn., tail, M-I coupling and GGCM (Global Geomagnetic Currents Modeling)
- Focus Groups under research areas
- FG V&V (renewed 2009) led by Masha Kuznetsova and Aaron Ridley
- CCMC web interface, plotting tools, data base and customized tables
- Other focus groups encouraged to submit challenges

Summary Discussion

- V&V valid for particular parameters, not entire model (BATS-R-US vs. Weimer) although AF policy is to support one global model for multiple parameters
- Joe: need for a parameter-specific CCMC V&V listing ("Hall of Fame")?
- V&V outcome depends on severity of event (hard to predict the intermediate events vs. large ones)
- Significant influence of data period selection and data quality (real time vs. archived) on V&V outcomes
- JASTP and JGR mentioned, but Space Weather Journal has central role as V&V repository