Space Environment modeling is not just collections of models. Confidence assessment of model predictions is an essential element.

- **Quantitative assessment** of models ability to simulate and predict space environment events and impact on human and technologies.
- Facilitate interaction between developers and users of space environment models.
- Define physical parameters and metrics formats relevant to specific applications.
- Address uncertainties in model-data comparisons.

CCMC provides support by archiving results and developing on-line interactive model validation systems, coordinate community tools development.

**Joint publications** (> 10 participating models, 8 papers)

**FOCUS SO FAR:** Comparison of time series from model and observation at specific locations/trajectories.
Processes for Validation
(Tim Fuller-Rowell)

Process 1: Quantifying the storm energy input.

Process 2 and 8: Combined penetration and dynamo electric fields and EIA response

Process 3: Build-up of plasma and structure at mid-latitudes

Process 4: Gravity wave propagation from high to low latitude

Process 6: Onset/timing/evolution of neutral composition change

Process 7: Ionospheric negative storm phase at mid latitude
Collaborative Development with Model Owners

Driver Swapping (MI Coupling) Patch-Panel Tool

- **High-Latitude Electric Potential Models**
  - empirical
  - data assimilation
  - global MHD
    - Heelis
    - Weimer
    - Foster
    - Heppner & Maynard
    - Ridley
    - AMIE
    - SuperDARN
    - SWMF
    - OpenGGCM
    - LFM

- **Particle Precipitation Models**
  - empirical analytical
  - global MHD
    - Fuller-Rowell & Evans
    - Hardy et al.
    - Ovation Prime
    - Roble & Ridley

- **Penetration Electric Field Models**
  - inner magnetosphere
    - Driven by SWMF:
      - FRC
      - CRCM
      - RCM
    - Driven by Tsyganenko:
      - RCM

All drivers are converted to a common format. The tool is called as a KAMELEON subroutine to provide values on the grid:

*call kameleon (model, time, mlts, mlats, variables, values_output)*

**IT Models:** CTIPE/TIE-GCM/GITM