CCMC Model Onboarding Questionnaire

By completing this questionnaire, you agree to the CCMC DATA Collection Consent Agreement.

1. Model Developer Metadata

Contact Information (add a copy of this table for each contact)	
First name	
Middle name (optional)	
Last name	
Organization Name	
Email (work/school)	
Role (check all that apply)	☐ Model Contact ☐ Model Developer

2. General Model Metadata

Model Name (e.g., WSA)	
Model Full Name if applicable (e.g., Wang-Sheeley-Arge Model)	
Model Release Date	
Model Version (e.g., 3.8)	
Code Languages (e.g., IDL, Fortran, C++)	
Model Description	
Change Log (notable changes compared to previous version)	
Inputs Description	
Outputs Description	

Model Caveats	
Model institution acknowledgement (Optional. Add rows as needed)	
Name	
URL	
Relevant Links, if any (example: link to source code on Github, link to online documentation about the model):	
Brief link name	
URL	
Long link Description (optional)	
Publication(s) (add rows as needed)	
DOI	Title

3. Model and Science Use Metadata

These are used to filter models on the CCMC website model catalog

Simulation Type (required; can select more than one):
- ☐ Data Assimilation
- ☐ Empirical
- ☐ Ensemble
- ☐ Physics-based
- ☐ Physics-based.Kinetic
- ☐ Physics-based.MHD
- ☐ Post_Processing_Tools

Model Run type (multiple selections ok)
- ☐ Runs-On-Request (RoR)
- ☐ Real Time/Continuous Runs (CR)
- ☐ Instant Runs (IR)

Temporal Dependence Possible? Can the results evolve with time?
- ☐ True
- ☐ False

Model Domains (required; can select more than one):
- ☐ Solar
- ☐ Heliosphere.Inner_Heliosphere
- ☐ Heliosphere.Outer_Heliosphere
- ☐ Geospace
- ☐ Magnetosphere.Global_Magnetosphere
- ☐ Magnetosphere.Inner_Magnetosphere.Plasmasphere
- ☐ Magnetosphere.Inner_Magnetosphere.RadiationBelt
- ☐ Magnetosphere.Inner_Magnetosphere.RingCurrent
- ☐ Local_Physics
- ☐ Global_Ionosphere
- ☐ High_Latitude_Ionosphere/Auroral_Region
- ☐ Thermosphere

Space Weather Impacts:

☐ Atmosphere variability (satellite/debris drag)

☐ Galactic cosmic rays - GCRs (human exploration, aviation safety, aerospace assets functionality)

☐ Geomagnetically induced currents - GICs (electric power systems)

☐ Ionosphere variability (navigation, communications)

☐ Near-earth radiation and plasma environment (aerospace assets functionality)

☐ Solar energetic particles - SEPs (human exploration, aviation safety, aerospace assets functionality)

List of Phenomena (This is domain specific)

Solar List:
☐ Solar_Magnetic_Field
☐ Coronal_Holes
☐ Coronal_Mass_Ejections
☐ Solar_Electromagnetic_Emissions
☐ Solar_Energetic_Particles
☐ Solar_Flares
☐ Solar_Spectral_Irradiance

Heliosphere List:
☐ Solar_Energetic_Particles
☐ Ambient_Solar_Wind
☐ Magnetic_Connectivity
☐ High_Speed_Stream
☐ Stream_Interaction_Regions
☐ Interplanetary_Shocks
☐ Heliospheric_Current_Sheet
☐ Interplanetary_Scintillation
☐ Coronal_Mass_Ejections_Propagation
☐ Coronal_Mass_Ejection_Arrival

Global Magnetosphere List:
☐ Geomagnetic_Storms
☐ Geomagnetic_Sub-storms
☐ Magnetosphere_Current_Systems
☐ Plasma_Sheet
☐ Magnetopause
☐ Bow-shock
☐ Cusp
☐ Magnetosheath
☐ Magnetic_Mapping
☐ Magnetotail_Dynamics
☐ Plasmoids
☐ Magnetic_Perturbations_at_Geosynchronous_Orbit
☐ Ground_Magnetic_Perturbations
☐ Ultra_Low_Frequency_Waves
☐ Flux_Transfer_Events
☐ Busty_Bulk_Flows
☐ Kelvin-Helmholtz_Instabilities
☐ Distant_Tail
☐ Near-Earth_Neutral_Line
☐ Magnetic_Reconnection

Inner Magnetosphere List:
☐ Ultra_Low_Frequency_Waves
☐ Whistler_Chorus_Waves
☐ Plasmaspheric_Hiss
☐ Electromagnetic_Ion_Cyclotron_Waves
☐ Other_Tyes_of_Waves
☐ Wave-particle_Interactions
☐ Particle_Dynamics
☐ Plasmasphere/Plasmapause_Dynamics
☐ Inner_Magnetosphere-ionosphere-thermosphere_Coupling
☐ Inner_Magnetosphere_and_Outer_Magnetosphere/Tail_Coupling
☐ Seed_Population_for_the_Ring_Current_and_Radiation_Belt/Preconditioning

Geospace List:
☐ Coupled_Geospace_System_Response_To_Drivers
☐ Magnetosphere-ionosphere_Convection
☐ Energy_Distribution_In_Coupled Geospace_System

Ionosphere List:
☐ Variablility_of_Plasma_Density
☐ Ion_Drift_Velocity
☐ Equatorial_Anomaly
☐ Traveling_Ionospheric_Disturbances
☐ Ionospheric_Scintillations
☐ HF_Signal_Absorption

Thermosphere List:
☐ Atmosphere_Expansion
☐ Neutral_Composition_Change
☐ Neutral_Wind_Change
☐ Traveling_Atmospheric_Disturbances

High Latitude Ionosphere/Auroral Region List:
☐ Ionosphere_Electrodynamics
☐ Particle_Precipitation
☐ Energy_Flow_into_Ionosphere
☐ Joule_Heating
☐ Ionosphere_Convection
☐ Polar_Wind
☐ Ionosphere_Particle_Outflow
☐ Field-aligned_Currents
☐ Cross-polarcap_Electric_Potential

4. CCMC User Experience

How do you envision CCMC users interacting with your model?

Run submission web interface: Input Parameters	
List all input parameters to be made available for the user on the web interface during run submission (add rows as needed). *Note: CCMC will create the web interface for the model in consultation with the model developers.*	
Input parameter name	**Short description, default value, units, valid range.**

Do any input parameters need to be visualized for the user on the interface prior to the run submission? Please describe.

Submission interfaces can be customized to serve both beginner and advanced users. Which model capabilities/parameter settings do you want to limit to beginner users and which do you want to expand for advanced users?

5. Resources

What **hardware resources** does this model need? (List here or attach documentation)

Processors (CPUs)	
Processors (GPUs)	
Memory (RAM) for CPUs and/or GPUs	
Disk space (for both input and output)	
If your model produces a very large amount of output (> a few TB):	
Do you have a plan for data reduction, such as post-processing, saving, or visualizing a subset of the output?	
Which inputs & outputs should be archived for long term storage?	
Other innovative hardware resources	
Does this model impact one hardware resource the most? For example, is it heavy on processing, memory use, or disk I/O?	
Run duration	

What **software resources** does this model need including any **version dependency**? (List here or attach documentation)

Specialized/licensed software and toolkits (e.g., IDL, Matlab)	
Compilers (e.g., Intel, Nvidia, gcc)	
Container software (e.g., Docker, Singularity)	
Libraries	
Web server (e.g., Apache)	
Operating system	
Other (e.g., Python, Java)	
List any **licensing info** for your model and any third-party open-source software used by your model	

Questions related to **build** instructions (list here or attach documentation)

List any **compiler flags, Makefile and/or configure script options** that are needed to build the model	
List any **environment variables** that are needed to build your model	
Please provide your general subjective impression on the **difficulty level for reinstalling the model** on a similarly configured system	

Questions related to **execution** (list here or attach documentation)

Does this model rely **on pre-processing tools/models/data streams** outside of the model itself (e.g., WSA, EEGGL, TdM Flux Rope Designer)? Please provide information on these.	
List the **input files** needed to run	
List any **environment variables** that are needed at run time	
Does your model require a **cronjob**?	

Web application delivery

If you are delivering a web application with/as your model, please submit a 2nd copy of this questionnaire (or copy/paste the tables above), answering the questions in the Resources Section only, specifically for your web application.

Guidelines: If model developers prefer to build their own model submission interface or any web applications associated with the model, to integrate them into the CCMC web ecosystem more easily, CCMC recommends the following:
- Test/run web applications with the Apache HTTPD web server with ModSecurity module
- If a backend relational database is needed, consider using MySQL Database

Please provide information and documentation on how to build, install, configure, and execute any web applications including list of libraries/dependencies, third-party software including open-source software needed or used by the application. If applicable, please provide licensing info for our review.

You will be provided with access to an AWS web server/instance for your web application onboarding. The application will only be available to certain IP addresses until it goes through security scan.   The web application cannot be made public until any scan items are addressed.

6. Guidelines for Model Delivery Package to CCMC

Delivery package should include the following:

- Model code
- Pre-and post-processing, visualization, validation, unit testing scripts/codes
- Documentation for model use and model installation (and any other documentation)
- Sample run(s) including scripts, inputs, outputs, and sample visualizations to test installations
- Example runs for the CCMC database to illustrate model potential to users