S2-02 Solar Indices and Irradiance Team

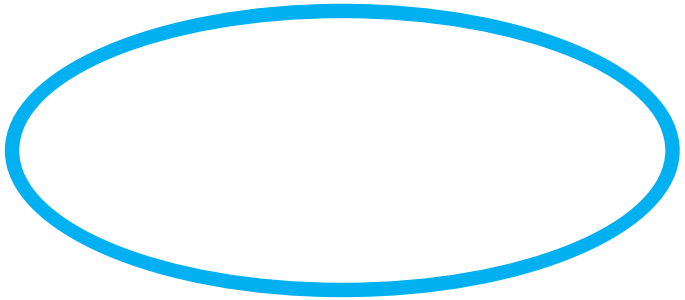
Team Lead: C. Henney (AFRL)

Co-lead: K. Muglach (NASA/GSFC, CUA)

ISWAT overview:

S: Space weather origins at the Sun	H: Heliosphere variability	G: Coupled geospace system	Impacts
S1: Long-term solar variability	H1: Heliospheric magnetic field and solar wind	G1: Geomagnetic environment	Climate
S2: Ambient solar magnetic field, heating and spectral irradiance	H2: CME structure, evolution and propagation through heliosphere	G2a: Atmosphere variability	Electric power systems/GICs
S3: Solar eruptions	H3: Radiation environment in heliosphere	G2b: Ionosphere variability	Satellite/debris drag
	H4: Space weather at other planets/planetary bodies	G3: Near-Earth radiation and plasma environment	Navigation/ Communications
			(Aero)space assets functions
			Human Exploration

Overarching Activities:
Assessment
Innovative Solutions
Information Architecture & Data Utilization
Education & Outreach



Introduction:

- Solar XUV (0.1-10 nm), EUV (10-120 nm), and FUV (120-200 nm) radiation is absorbed in the Earth's upper atmosphere, driving ionization and heating of the neutral atmosphere.

- Current Ionosphere-Thermosphere (I/T) models are capable of using measured VUV (0 to 200 nm) spectral information to drive the models, as well as modeled EUV spectra based on solar indices (e.g. F10.7, Mg II index (core-to-wing ratio), solar sunspot number (SSN)).

Near-term goal of team:

- Create a real-time scoreboard of publicly available model predictions of solar indices (to be set up by CCMC)

What is needed for this:

- Input requirements of I/T forecast models (which index, time cadence, …)
- Meta-data & file format for community scoreboard
- Identify community solar index forecast models to include in scoreboard
- Include baseline models in the scoreboard (recurrence and persistence)

First step:

- Use AFRL SIFT model to set up prototype of scoreboard (done by CCMC)
- Current indices: F10.7 flux, Mg II index, Solar Sunspot Number (SSN)
- SIFT can produce 1-7d forecasts at 2h cadence
- Scoreboard will display model forecasts (including persistence and recurrence) with latest observed value
- Additional participation from NOAA/SWPC (human-in-the-loop forecast)

Following steps:

- Advertise prototype and invite community to participate
- Add additional indices according to what is needed by I/T models and according to what can be provided by solar modeling

G2A - S2-02 session:

Discussion with I/T community:

- Additional indices: F30 flux, S10 index
- Confirm: 1-7d forecasts at 2h cadence
- 3 additional modeling groups are interested to participate
- Include uncertainties for both observed and model index