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**Proposal Title:** Flux Transport Solar Cycle Simulations for Total and Spectral Solar Irradiance Modeling

**Abstract:**

A new method of calculating solar total and spectral irradiance using a flux transport solar cycle model is proposed. The flux transport model calculates the distribution of magnetic flux over a spherical model Sun with parameterized meridional circulation, differential rotation, and dispersion. The model can closely replicate existing magnetogram data through assimilations of SOHO/MDI data or it can simulate widely differing solar conditions from Maunder minimum conditions to hyperactive cycles. Total irradiance is calculated by using facular brightness levels from 3D compressible radiative magnetohydrodynamic numerical simluations in place of empirical contrast models. Spectral irradiance in the 1-300 Angstrom bandpass is calculated using a potential field source-surface and loop heating models to create simulated solar coronal conditions for any given magnetic configuration. The model is useful for parametric studies of varying solar cycle conditions on the Earth's climate and upper atmosphere. It will also be incorporated into the existing Lockheed Martin Space Weather Forecasting system.