

# E1 WG: Solar Irradiance

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# Goals

- ▶ Promote further progress in the field of solar variability
- ▶ Recommend which solar irradiance datasets external researchers use
- ▶ Improve collaborations between solar- and stellar-variability modelers and observers

# WG Members

- ▶ Experts in MHD simulations, solar magnetic fields, radiative transfer, and solar-stellar connections
- ▶ CO-CHAIRS
  - ▶ Greg Kopp and Alexander Shapiro
- ▶ WORKING GROUP MEMBERS
  - ▶ Robert Cameron, Paul Charbonneau, Ilaria Ermolli, Matthieu Kretzschmar, Natalie Krivova, Werner Schmutz, Sami Solanki, Yvonne Unruh, and Ilya Usoskin

# Tasks and accomplishments

- ▶ Assess uncertainties and associated causes in the solar irradiance datasets and resulting reconstructions
  - ▶ Detailed comparison of the available models have been performed. It was shown that empirical models of solar irradiance, such as NRLSSI and SOLID significantly underestimate solar variability in 280-400 nm spectral domain (Yeo et al. 2017, Egorova et al. 2017)
- ▶ Create a database in the form of links to original sources containing modeled and observed solar irradiance records
  - ▶ Done (see “Links” slide)
- ▶ Provide recommendations for the climate community and other external researchers on which records to use depending on the timescale and wavelength domain
  - ▶ The ISSI team 373 “Towards a unified solar forcing input to climate studies” was set up and led by Natasha Krivova. The team will soon release a new SSI recommendation

# Tasks and accomplishments

- ▶ Incorporate knowledge of stellar analogs into solar irradiance variability estimates and uncertainties on centennial timescales
  - ▶ Solar/stellar comparisons session in IAU GA XXX FM9, Splinter Session at Cool Stars 20
  - ▶ ISSI team 446 “Linking Solar and Stellar Variabilities” proposed by Alexander Shapiro is selected
- ▶ Estimate the effect from the recent reanalysis of sunspot number on solar irradiance reconstructions
  - ▶ ISSI team 417 “Recalibration of the Sunspot Number Series” (G. Kopp and I. Usoskin are members) selected and half-way through effort
- ▶ Organize a Focus Meeting on solar irradiance at the IAU GA XXX in Vienna
  - ▶ FM9 “Solar Irradiance: Physics-Based Advances” was held 22-23 Aug. 2018 with 61 abstracts submitted and 269 attendees expressing interest

# Links to Data and Useful Websites

- ▶ [SATIRE \(Spectral And Total Irradiance REconstructions\)](#)
  - ▶ [SOLar Radiation and Climate Experiment \(SORCE\)](#)
  - ▶ [TSI Calibration Transfer Experiment \(TCTE\)](#)
  - ▶ [LISIRD](#)
  - ▶ [Greg Kopp's TSI Page](#)
  - ▶ [SOLVe group webpage](#)
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- ▶ (And others; continually in flux)