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## The Time Evolution of Faculae and Plage in Solar Cycle 23

### Abstract:

The Sun is a variable star and its irradiance has been measured and analyzed since the 1800's. Early astronomers noted that the sun has a distinct solar cycle in which the total radiative output of the sun is highest at solar maximum, lowest at solar minimum, and there is an average variation in irradiance of about .1 to .15% over the 11 year solar cycle. However, recent observations of the irradiance at different wavelengths using the Solar Irradiance Monitor (SIM) have revealed that this decline in irradiance when approaching solar minimum does not hold for all wavelengths. There are offsetting trends in the variation of irradiance such that their additive effects produces the Total Solar Irradiance graph seen at the top of this poster. This is an important discovery towards further understanding how the Sun works because it is now known that the progression from solar maximum to minimum does not affect individual components of the sun in the same way. This poster aims to demonstrate that these offsetting trends can also be seen when searching for facular and plage regions. I identify these regions as either dark or bright and show that their variation over the descending portion of Solar Cycle 23 reinforce the assertion that the offsetting irradiance trends do, in fact, exist and that the sun is a much more dynamic star than first thought.