

Solar Variability's Impact on the Schumann Resonance Parameters

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The sun's activity varies on many time scales, from days (solar flares, CMEs), to months (27-day rotation), to years (11 year solar cycle). At all of these time scales changes in ionizing radiation are observed at the Earth. These changes in ionization can impact the lower ionosphere conductivity and hence the Earth-ionosphere waveguide. Within this waveguide are trapped electromagnetic waves, produced by global lightning activity, called the Schumann Resonances. These global resonant waves occur at 8, 14, 20, 26 and can be characterized by their amplitude, frequency and damping at any time. Observations from two stations in California and Israel were analyzed to investigate the impact of the solar variability on the Schumann resonance parameters. We see changes in all the Schumann resonance parameters on ALL time scales from X-ray bursts to the 11-year cycle. We interpret these changes as being due to the changes in the upper boundary of the Earth-ionosphere waveguide, and not due to direct influences on the lightning activity in the troposphere.

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