

Solar Activity and Responses Observed in Balmer Lines

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The ~daily solar irradiance measurements made by the Aura/OMI and Sentinel-5P/TROPOMI instruments are capable of observing subtle variations in solar absorption features such as hydrogen Balmer lines, using the core-to-wing ratio method that provides stable measurements despite possible instrument degradation, as previously developed for the Mg II and Ca II features. Analysis of these data shows that, on 27-day solar-rotational timescales, the upper-Balmer series lines closely follow changes in the total solar irradiance, thus diverging from the behavior observed in other chromospheric-sensitive transitions. This behavior persists through both active- and quiet-Sun epochs.