Variations in total solar irradiance during solar cycles 21 and 22

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Total solar irradiance have been observed from space for more than 14 years. These irradiance observations performed on board the Nimbus-7, SMM, UARS, and EURECA satellites have shown variations in total solar irradiance related to the solar cycle and the evolution of active regions. In this paper changes in total solar irradiance observed by the SMM/ACRIM I and UARS/ACRIM II radiometers are studied on both active region and solar cycle time scales. The irradiance variations are compared to changes in sun spot darkening and the enhanced emission of bright plages and the magnetic network. Quantitative indices of sun spot darkening have been derived from the area and position of sunspots published in the Solar Geophysical Data catalogue. The Mg 11 c/w ratio, measured by the Nimbus-7 and NOAA9 satellites, is used as proxy for the bright magnetic elements (including plages and the magnetic network).