On the Stability of Solar Spectral Irradiance Records

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Solar spectral irradiance (SSI) measurements have been acquired in space since the 1960's. These data are of extreme importance to assess the variability of the Sun in the last decades as well as to understand how its magnetic activity affects its radiative output, and therefore to constrain solar variability further in time. However, these data sometimes disagree among themselves or with our expectations deduced from well known observed proxies, and it is then hard to disentangle instrumental effects from possible solar effects.

In the context of the European collaborative project SOLID (First European comprehensive SOlar Irradiance Data Exploitation) project, we will present results regarding a common assessment of the mid- and long-term (> 1yr) SSI variations observed by all instruments since the 60's, focussing on the ultraviolet wavelength range, where more instruments have been operating.

Our approach consists in attempting to reproduce each solar irradiance dataset by a combination of proxies, and the starting assumption is therefore that solar proxies contain enough information to reconstruct the SSI variability with a satisfactory precision; we note that this is different from comparing each dataset with an already defined proxy-based model.

We used the (dis)agreement between the observed and modeled SSI to provide an independent measure of the stability of the SSI dataset. We will present the stability assessment of all irradiance datasets as well as some detailed cases.