



Variability of the solar shape

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Variations of the diameter, shape and irradiance are ultimately related to solar activity, but a further investigation of how a weak magnetic field might cause variations in the output energy, combined with a shrinking or an expanding shape is still needed. Indeed, accurate measurements of the solar diameter started by Jean Picard showed that the solar diameter might be greater during the Maunder minimum of the solar activity. After Picard (and some other heirs), there has been a lot of other measurements, ground-based or from space. In this lecture we will review the question, extending diameter variability to shape changes. We will show how recent helioseismology results allow us to look at the variations below the surface, where changes are not uniform, and putting in evidence a new shallow layer, the leptocline. We will base our discussion on physical grounds, and showing why it is important to get accurate measurements from space (SDO–Solar Dynamics Observatory, Golf-NG/Dynamiccs). Such measurements will provide us a unique opportunity to study in detail changes of the global solar properties and their relationship to changes in the Sun's interior.