

Space Plasmas in the Solar System, including Planetary Magnetospheres (D)
Space Climate: From Past to Present and into the Future (D2.6)

EVOLUTION OF THE SOLAR LUMINOSITY SINCE THE END OF THE MAUNDER MINIMUM

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The total solar irradiance (TSI), the radiant flux at the top of Earth's atmosphere and normalized to 1 AU, is part of the solar luminosity in the Earth's direction. Reconstructions, which are based on sunspot records since systematic observations, suggest the existence of secular trends in TSI. Although these models correctly incorporate the processes that lead to the variability of the TSI, they make no assumptions regarding the energetics in the convection zone. Here we present a model for the long-term evolution of the solar luminosity based on sunspot observations considering the energy flux in the convection zone. We found that the long-term trend in the solar luminosity (and TSI) is the opposite of the previously suggested by other physics-based models. We discuss in detail our approach and the constraints.