



Influence of the 11-year solar cycle on the Martian photochemistry

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The sun is a variable star and its variation is manifested most strongly in the UV, EUV, and X-rays domains, wavelengths ranges which are photochemically active in planetary atmospheres. On Earth, variation of the solar irradiance over the 11-year cycle is known to produce changes in the ozone content of the order of a few percents in the mesosphere and upper stratosphere. Using the recently developed chemical model coupled to the LMD general circulation model of the Martian atmosphere, we will present a first three-dimensional study of the influence of the 11-year solar cycle on Mars. Solar irradiance spectra measured for two solar activity levels from XUV to IR will be introduced in the photochemical model, from which the impact of the solar variation on the photolysis of CO₂ and other active species will be calculated. General circulation model simulations with chemistry will then be integrated to quantify the influence of the solar cycle on the Martian ozone layer as well as its possible effect on the production of CO at a global scale.