An Empirical Model of the Variation of the Solar Lyman-α Spectral Irradiance

Matthieu Kretzschmar [1] *[matthieu.kretzschmar@cnrs-orleans.fr], Martin Snow* [2]*, and Werner Curdt* [3]

[1] *LPC2E, CNRS and University of Orléans, Orléans, France*
[2] *Laboratory for Atmospheric and Space Physics, University of Colorado – Boulder, Colorado, USA*
[3] *Max-Planck-Institut für Sonnensystemforschung, Göttingen, Germany*

We propose a simple model that computes the spectral profile of the solar irradiance in the hydrogen Lyman alpha line, H Ly-α (121.567nm), from 1947 to present. Such a model is relevant for the study of many astronomical environments, from planetary atmospheres to interplanetary medium. This empirical model is based on the SOHO/SUMER observations of the Ly-α irradiance over Solar Cycle 23 and the Ly-α disk-integrated irradiance composite. The model reproduces the temporal variability of the spectral profile and matches the independent SORCE/SOLSTICE spectral observations from 2003 to 2007 with an accuracy better than 10%.