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## Reconstruction of the solar spectral UV irradiance for nowcasting of the middle atmosphere state on the basis of LYRA measurements

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**Abstract.** The LYRA instrument onboard ESA PROBA2 satellite will provide 6-hourly solar irradiance at the Lyman-alpha (121.6 nm) and the Herzberg continuum (~200–220 nm wavelength range). Because the nowcasting of the neutral and ionic state of the middle atmosphere requires the solar irradiance for the wide spectral range (120–680 nm) we have developed the statistical tool for the reconstruction of the full spectrum from the LYRA measurements. The accuracy of the reconstructed irradiance has been evaluated with 1-D transient radiative-convective model with neutral and ion chemistry using the daily solar spectral irradiance measured with SUSIM and SOLSTICE instruments onboard UARS satellite. We compared the results of transient 1-year long model simulations for 2000 driven by the observed and reconstructed solar irradiance and showed that the reconstruction of the full spectrum using linear regression equation based on the solar irradiance in two LYRA channels can be successfully used for nowcasting of the middle atmosphere. We have also identified conditions when the proposed approach does not yield spectral reconstruction with sufficient accuracy.

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