

RETRIEVAL OF O, O₂, O₃ AND N₂ MESOSPHERIC AND THERMOSPHERIC DISTRIBUTIONS FROM PROBA2-LYRA OCCULTATION DATA

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LYRA is a solar EUV/VUV radiometer that will embark in 2008 on-board PROBA2, an ESA micro-mission. LYRA will monitor the solar irradiance in four passbands: Lyman-alpha (121.6 nm), the 200-220 nm range corresponding to Herzberg continuum, the 17-80 nm range defined by Aluminium filter and the 1-20 nm range defined by Zirconium filter, where solar variability is highest. LYRA will benefit from pioneering wide bandgap detectors based on diamond. These sensors make the instruments radiation hard and solarblind: they minimize the use of additional filters to block the unwanted visible light, but which also attenuate seriously the desired UV radiation. This enhances the detectors effective area, and therefore increases the accuracy, the cadence, or an optimal combination of both. The PROBA2 heliosynchronous orbit generates brief eclipses three months per year. These allow studying the high atmosphere composition by the solar occultation method. Chemical species addressed are thermospheric N₂, O, O₂ and mesospheric O₂ and O₃ in the winter hemisphere. LYRA's high cadence (up to 100 Hz) and signal to noise ratio offer the possibility to reach a very favourable vertical sampling, unfortunately counterbalanced by the extent and inhomogeneity of solar source. The chosen inversion method takes these hurdles into account by dividing the sun surface into parcels and analyzing the contribution of each parcel independently. We present results from simulated data and an error budget estimation.