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Description of the dataset of System 1 “Phaeton”, resulting from the characterization using the ATLAS facility

1 Introduction

The following report briefly describes the measurements resulting from the characterization of the spectroradiometer system Phaeton, using the tuneable laser facility ATLAS.

2 Measurement setup

The system was installed in the optical laboratory of PMOD/WRC, on the ATLAS facility. Measurements were performed over the wavelength range 295 nm to 455 nm, which is the operating range of the Phaeton system. The two main objectives of the measurements were the characterization of the linearity and the line spread functions. The measurements took place during the period 24 February to 3 March 2016, resulting in a combined dataset of 337 MB, archived on the main server of PMOD/WRC, under:

\\ad.pmodwrc.ch\Institute\Projects\ATLAS\Atlas\Data\Phaeton.

The measurements were performed according to the standard operating procedures ATLAS_SOP_linearity and ATLAS_SOP_LSF.

3 Linearity Characterisation

The measurements of the linearity of the Phaeton system were performed by varying the intensity of the laser output beam, as well as by changing the integration times of the Phaeton detection system. A sample of each measurement process is shown below:

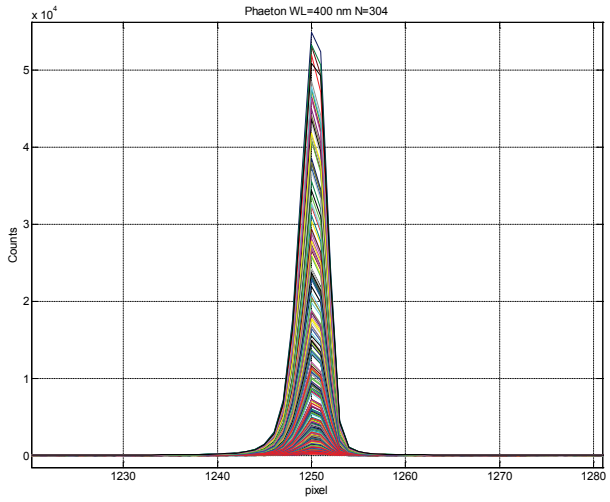

Figure 1 Total of 304 measurements at 400 nm for different intensities and different integration times

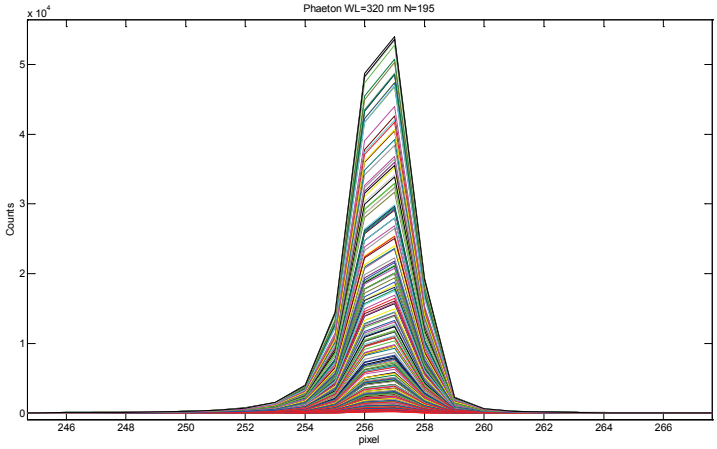

Figure 2 Total of 195 measurements at 320 nm for different intensities and different integration times

4 LSF Characterisation

The measurements of the line spread functions were performed by combining measurements at different saturation levels with an unsaturated measurement in order to achieve a dynamic range of the line spread function of at least 10^{-5}. The resulting line-spread functions are shown in the figure below:

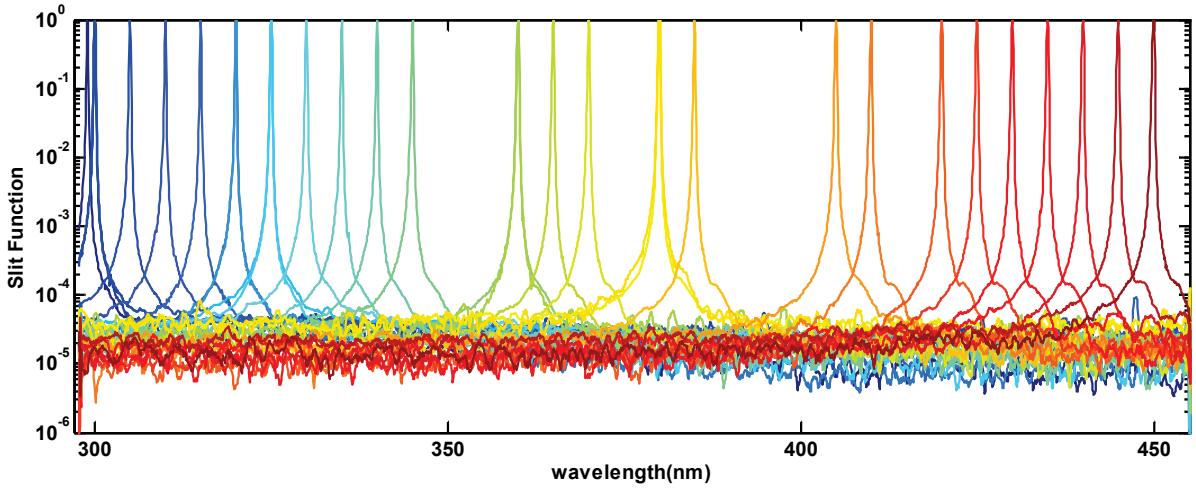

Figure 3 Line spread function measurements for different wavelengths of the tuneable laser system ATLAS.

The slit functions of these measurements allow to determine to the full width at half maximum and the slit function shape across the operating range of the spectroradiometer. An example at 308 nm is shown below:

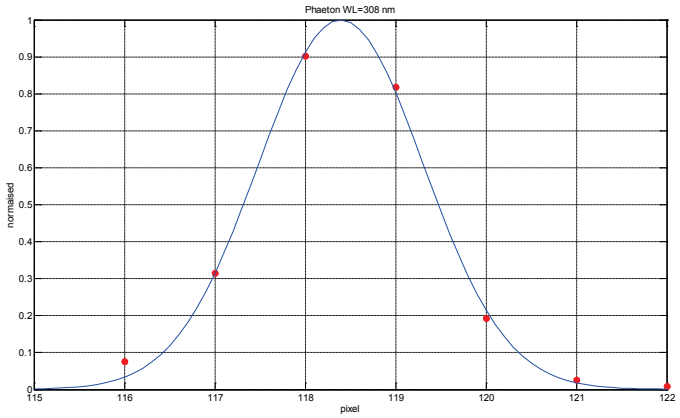

Figure 4 Slit function measured at 308 nm. The measurements are shown as red dots, while a Gaussian fit to the data is shown with the blue curve. The center of the slit function is at 118.4 pixel, with a FWHM of 2.15 pixel.

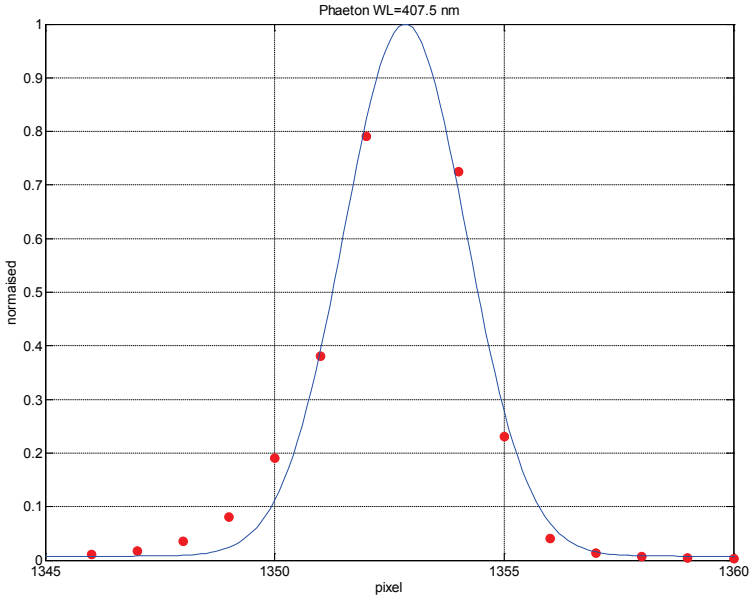

Figure 5 Slit function measured at 407.5 nm. The measurements are shown as red dots, while a Gaussian fit to the data is shown with the blue curve. The center of the slit function is at 1353 pixel, with a FWHM of 3.15 pixel.

5 Data archive

The measured data is archived in matlab format on the PMOD/WRC server, at
\\ad.pmodwrc.ch\Institute\Projects\ATLAS\characterisations

The Dokumenten History

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1.0	21.6.2016	JG	First Version of document