

CRIRES Science Verification Proposal

Title: A high-resolution spectral atlas of the night sky

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Abstract:

We propose to obtain a $R = 100,000$ spectral atlas of the night sky from 950 to 2300nm. Such an atlas would have a resolution 12 times higher than any atlas now available. We will also measure the wavelength stability of night sky lines by repeatedly measuring selected wavelength regions over different nights.

Scientific Case:

We propose to obtain a high-resolution ($R = 100,000$) spectral atlas of the night sky from 950 to 2300 nm, requiring about 110 setups with CIRIRES.

The CIRIRES atlas will be an invaluable tool for those who wish to use the emission lines from the night sky to calibrate high resolution IR spectra. A similar albeit much lower resolution spectrum obtained with ISAAC is well cited (Rousselot et al. 2000).

We will also select several wavelength regions that are rich in night sky lines to monitor the precision of the wavelength calibration. We wish to determine if the lines can be used for accurate wavelength calibration or if they are sensitive to wind conditions in the upper atmosphere.

There is no need to flux calibrate, so there is no need of a standard. The program can be executed between sunset and the first possible acquisition of a guide star.

Depending on yet undetermined overheads, 3 to 4 setups per night can be obtained. In addition, additional setups can be executed during bad seeing conditions.

The OBs could be used also during the following SV runs.

Reference: Rousselot et al. 2000 A&A 354, 1134

Required observing time

Target	RA	DEC	Wavelength Band	Magnitude	DIT	NDIT
Zenith			All		300	1

Simple observations: pointing at zenith, no acquisition, no AO.

Slit width: 0.2 arcsec

To cover the entire wavelength range from 950 to 2300 nm, we'll need 110 setups. An observation would consist of a sky spectrum followed by a ThAr arc. No telluric standard is needed.