RevMexAA (Serie de Conferencias), **29**, 137–137 (2007)

ELMER SPECTROSCOPY: CHARACTERIZATION AND PERFOMANCE RESULTS FROM THE PRE-SHIPPING ACCEPTANCE TESTS

A. Cabrera-Lavers,[1,3] M. García-Vargas,[2,3] J. Martín-Fleitas,[1] R. Kohley,[1] E. Sánchez-Blanco,[1] P. Hammersley,[1] M. Maldonado,[1] R. Vilela,[1] J. L. Barreto,[1] and J. M. Rodríguez-Espinosa[1,3]

Elmer is a multi-purpose instrument for the GTC designed for both Imaging and Spectroscopy in the visible range (365 nm–1000 nm).Spectroscopy in Elmer is done by using 2 prisms, 2 grisms, and 6 VPHs as dispersive elements, providing resolving powers of 200, 1000, and 2500, respectively over the whole wavelength range for a 0.6″ slit width.

The complete set of tests performed to characterize the spectroscopic modes of Elmer have been recently finished at the Instituto de Astrofísica de Canarias (IAC). Important parameters like: fiducial position and slit viewing (for acquisition), spectral coverage, spectral resolution (both resolving power and dispersion either in the center of FOV or in any position on it), central wavelength, flexures, focus, image quality (EER_{80} better than 1.5 pixels), throughput and ghosts, associated to each of the dispersive elements and in each of the possible configurations have been measured. Results obtained fulfill all the design requirements of the instrument, except the flexure, for which we have found a value of 1.5 pix over 180°, larger than the 0.5 pix required to observe a target at 1° from the Zenith during 6 hours without de-rotation. However, this requirement was too restrictive, and the achieved flexure is good enough for nearly all the observations planned with Elmer.

For both Longslit and Multi-Object Spectroscopy (MOS) modes, the more appropiate combination of arc lines (by using HgAr, Ne, and Xe pencil style spectral lamps) for each element have been selected after a series of tests to produce a final line list optimized for the further calibration of spectroscpic data obtained with Elmer. This will be included in the final pipelines developed for the instrument as well as they will be taken into account for defining the optimun calibration strategy for each element.

For the Multi-Object Spectroscopy mode, a calibration mask with 46 pinholes has been used to obtain spectra covering the whole FOV of the instrument, usable in spectroscopic mode (3’×3’ with masks, or 4.2’ for slitless observations). We determined in that way the spectral coverage for each VPH/grism according to the position of the source in the FOV. This will help the future users to define the best observation strategy for their scientific program as some relevant lines can be lost, depending on the source position within the FOV.

More details about Elmer's characterization and performance can be seen in García-Vargas et al. (2006, Proc. SPIE, 6269, 19), and Cabrera-Lavers et al. (2007, this volume).

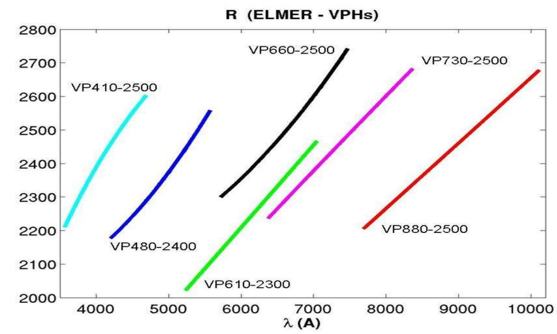

Fig. 1. Resolving power (for a 0.6″ slit width) vs. wavelength for the six VPHs that Elmer provides, covering the whole range from 365 nm to 1000 nm.

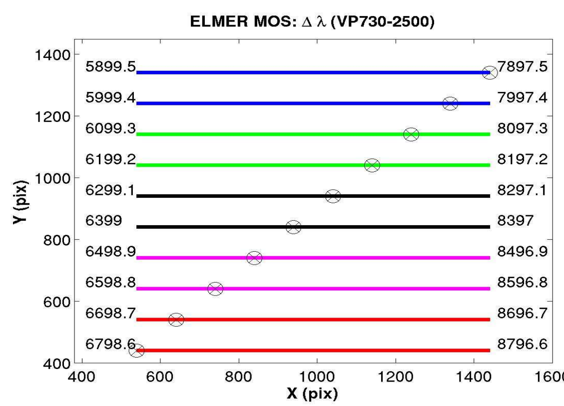

Fig. 2. Spectral coverage map for Elmer VP730-2500. Circles mark the position of the source on the image and the values shown at each side of the line are the two extreme attainable wavelengths. Be aware that in the three lower positions, the Hα line is lost.

[1]GTC Project Office, Instituto de Astrofísica de Canarias, La Laguna, Tenerife, Spain (antonio.cabrera@gtc.iac.es).
[2]FRACTAL SLNE, Las Rozas, Madrid, Spain.
[3]IAC, La Laguna, Tenerife, Spain.