

## Report

COST-STSM-MP1104-11992 Electronic compensation of instrumental polarization  
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Within the period of the COST STSM application (October 24 to November 23) the topic described in the application could be studied and solved. In particular a software has been written that does the compensation for the instrumental polarization. The following steps are performed by the software:

- Measure unpolarized light (continuum wavelength interval from the solar disc center) without compensation
- Calculate how to choose the charge shifting times to get similar intensities in each of the four rows
- Test the new settings with a new measurement of unpolarized light
- If required, iteration to get better results
- Set the parameters for the scientific measurements

To test the procedure a polarization of up to 10% was artificially produced by a tilted glass plate. Measurements were made with and without compensation. The three Stokes-parameters Q,U and V could be reduced down to about 0.2%

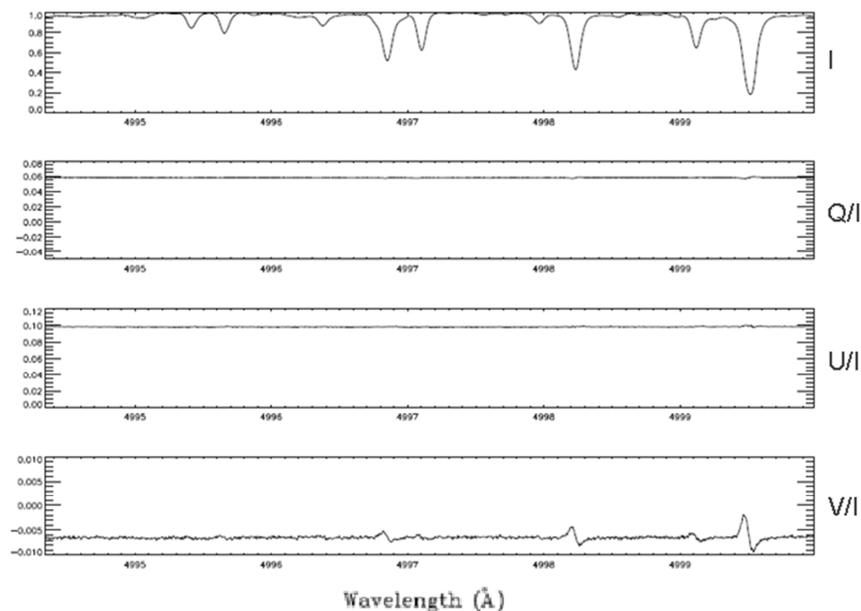


Fig. 1 Measurement of the full Stokes-vector with artificially produced polarization. No compensation was made.

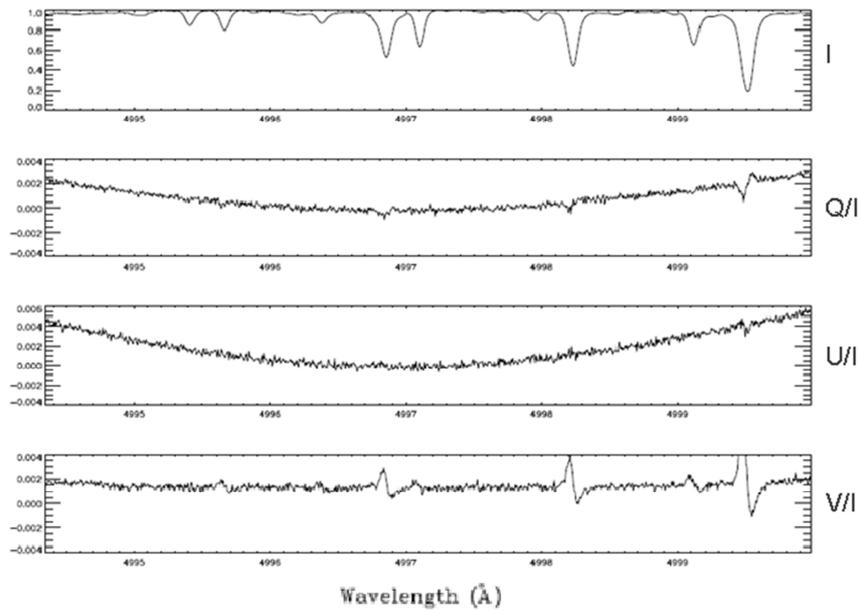


Fig. 2 Same Measurement as before. Polarization has been electronically compensated.

The origin of the curvature in the measurements with compensation has instrumental origin and is constant. Thus it is not a big problem for using the method because the curvature can easily be taken into account by an additional flat field measurement.

Finally the electrical compensation was compared with the optical compensation which had been used up to now.

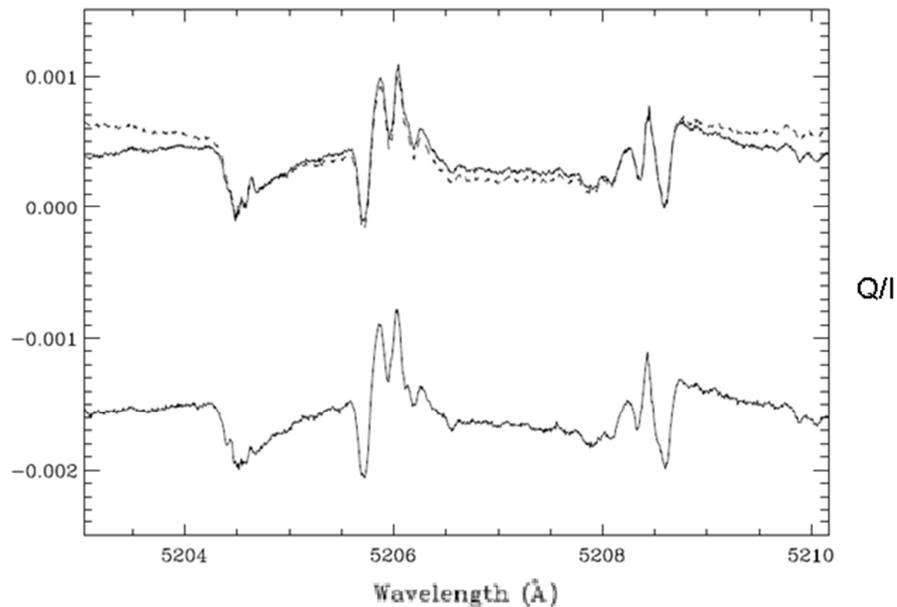


Fig. 3 Lower graph shows the scientific measurement with the normal optical compensation. The upper graph shows the same measurement with electrical compensation. The dotted line is the one where the curvature not yet has been taken into account.

The new compensation method works out well and gives results similar to those gained with the normal compensation. It does not affect the incoming signal in an unwanted way.

For the FLC modulator the possibility to manipulate the charge shifting times has been implemented and tested. First measurements of the effect of the times were made and put into a model.