

# Calibration of the instrumental polarization effects of SCExAO-CHARIS' spectropolarimetric mode

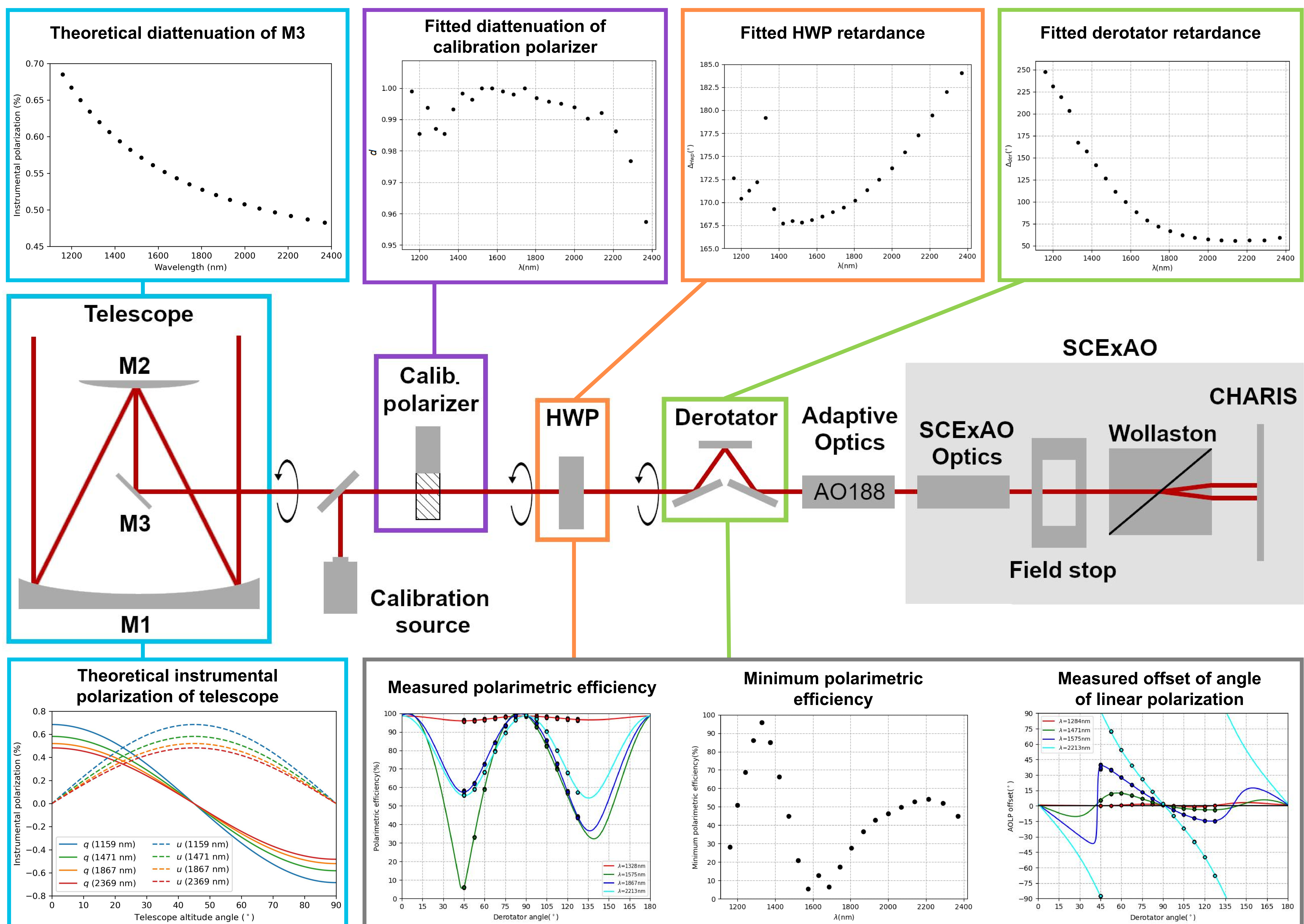
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## Overview

The high-contrast imager SCExAO-CHARIS at the Subaru telescope has a unique integral-field spectropolarimetric capability in the JHK-bands. We are developing a Mueller matrix model that describes the instrumental polarization effects of the complete optical path. From measurements with the internal light source, we find that the image derotator (K-mirror) produces strong wavelength-dependent crosstalk, in the worst case converting approximately 95% of the incident linear polarization to circularly polarized light that cannot be measured. Using theoretical calculations, we have estimated the instrumental polarization of the telescope.

## Outlook

We plan to more accurately determine the instrumental polarization of the telescope with observations of a polarization standard star, and fit more comprehensive physical models to all experimental data. In addition, we plan to integrate the complete Mueller matrix model into the existing CHARIS post-processing pipeline, with the aim to achieve a polarimetric accuracy of  $<0.1\%$  in the degree of linear polarization. Our calibrations of CHARIS' spectropolarimetric mode will enable unique quantitative polarimetric studies of circumstellar disks and planetary and brown dwarf companions.



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