

VST in the era of the large sky surveys



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VST: the first large survey telescope for optical polarimetry

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“Replacing the unused ADC by a polarizing filter would transform the VST into the first large polarimetric optical survey telescope, without affecting the current capabilities of the VST+OmegaCAM system.

Scientific cases include: mapping the Milky-Way and Magellanic clouds magnetic fields, surveys of quasar polarization, identification and variability of polarized brown dwarfs, polarimetric characterization and mapping of solar-system objects (incl. the moon, comets, and asteroids), detection of polarized signal around the L4 and L5 Lagrange points, a census of magnetic white dwarfs and Herbig Ae/Be stars, etc...

The design of the VST limits the technical implementation for the polarimetric unit to a single-beam system: therefore, we will develop data-driven calibration methods to achieve a sub-percent polarimetric accuracy.

The proposed implementation is of low cost and requires no major development, as polarizing filters of the needed size are readily available. In particular, it does not require major modification neither of VST, nor of OmegaCAM. In fact, the currently offered capabilities of the VST+OmegaCAM are preserved as the polarizing filter can be removed from the optical beam. Would this project be accepted, efforts will be needed on the design of the polarimeter unit to optimize accuracy and execution times, on the design of the calibration plan, and on the extension of the data reduction pipeline to extract the polarization signals.

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