

International School of Space Science
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The velocity and magnetic fields at two heights of the Sun's atmosphere

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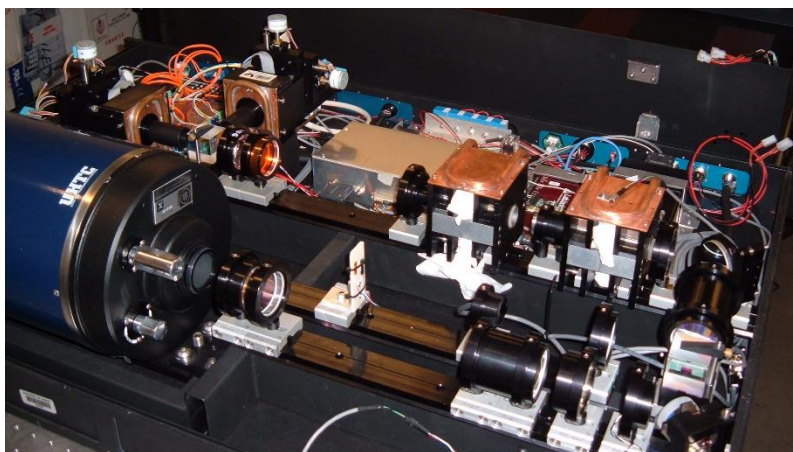
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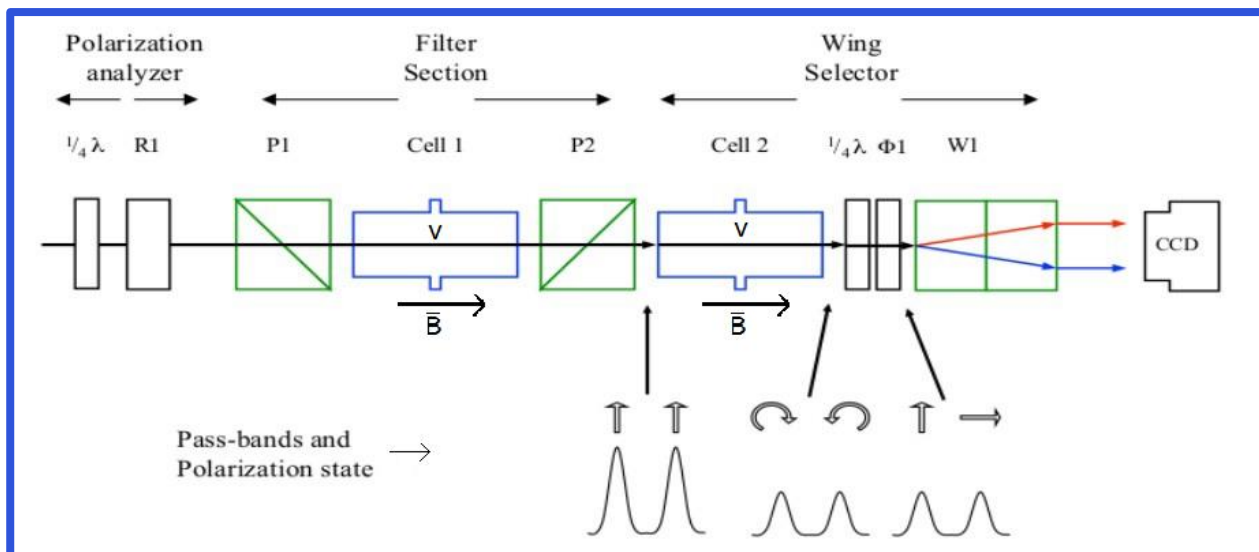
⁶INAF/Osservatorio Capodimonte, ITALY

MOTH II - Magneto-Optical filters at Two-Heights



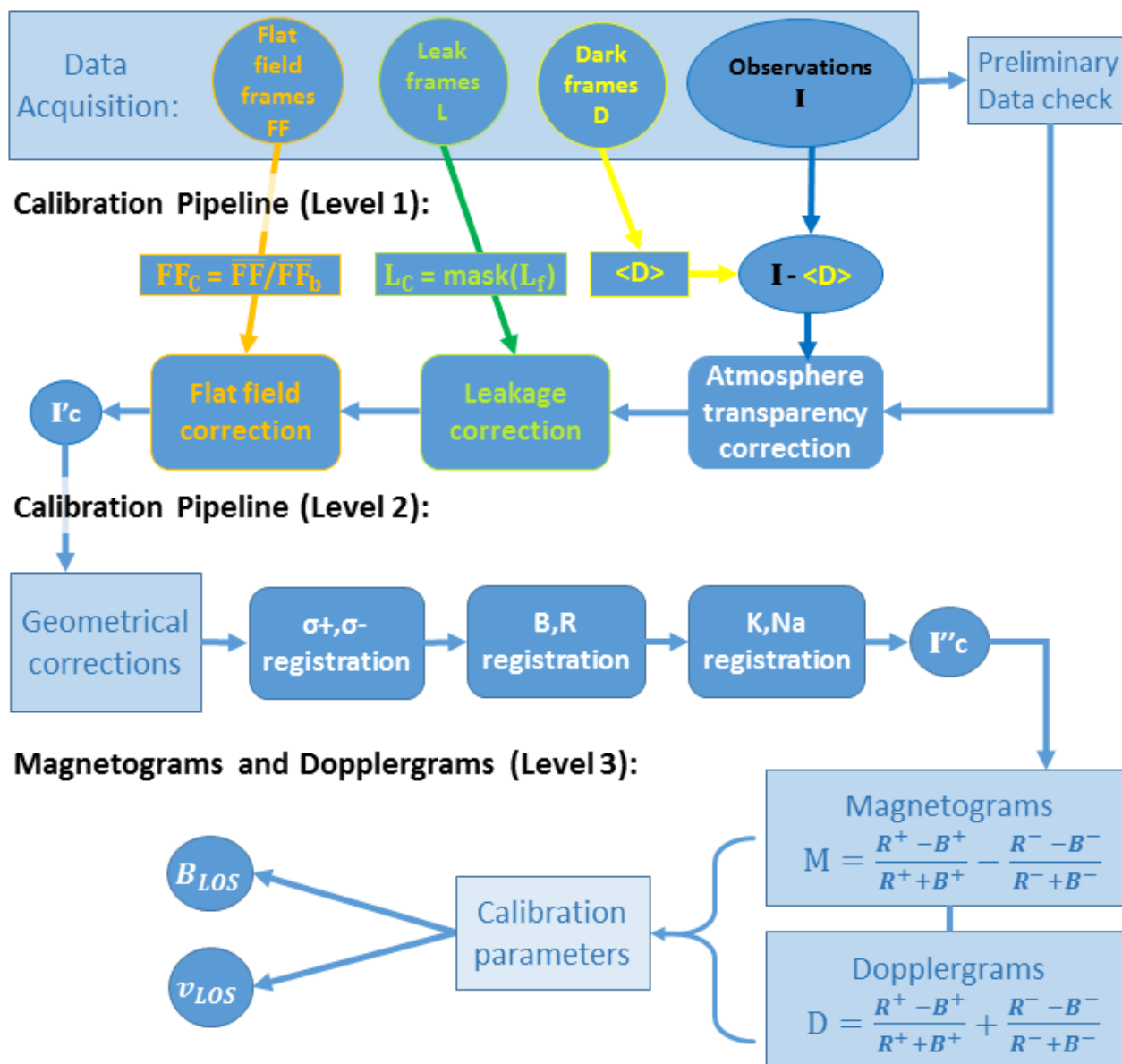
Instrument specifications:

- Full disk images
- CMOS 2048x2048 pixels
- Aperture: 20 cm
- Pixel scale: 1 arcsec/pixel
- Sensitivity: 7 m/s for v; 5 Gauss for B.



line	λ (nm)	Formation height (km)
K I	770	300-400
Na D2	589	600-700
Ca I	422	1000
He I	1083	1900
Fe I (HMI)	617	100
Ni I (MDI)	677	125

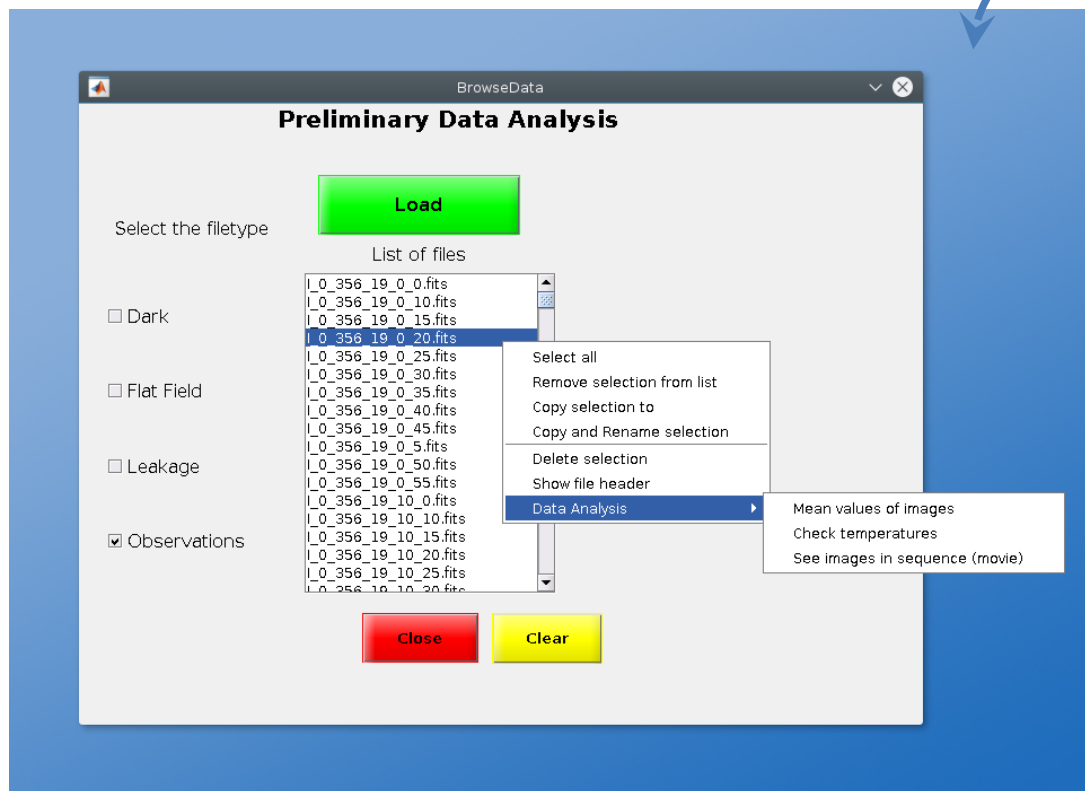
MOTH Calibration Pipeline



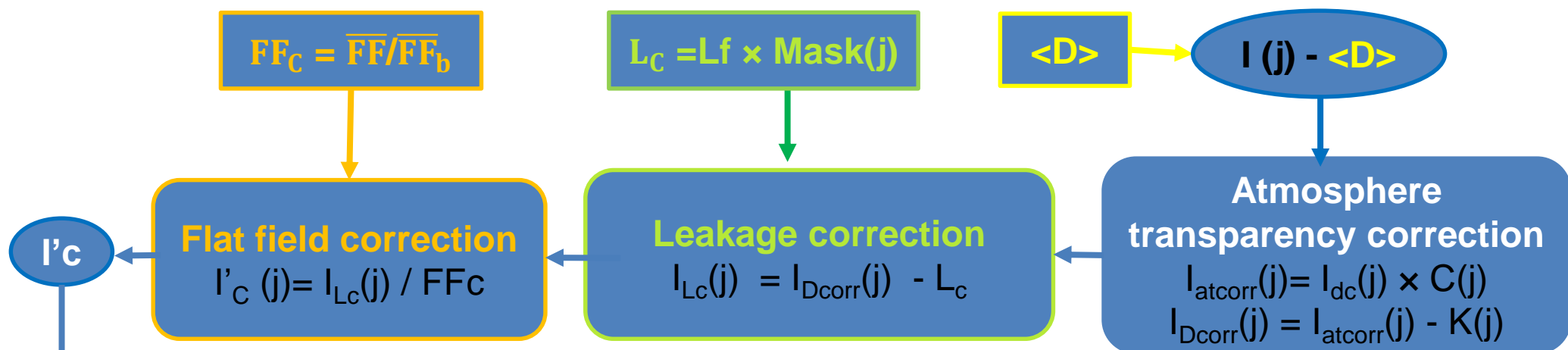
Calibration Pipeline (Level 0)



- Image statistics (mean values, max, min, rms)
- Temperature check (MOF, CMOS, prefilter, box,...)
- Tracking
- Dark current
- Flat Filed & Leakage Images



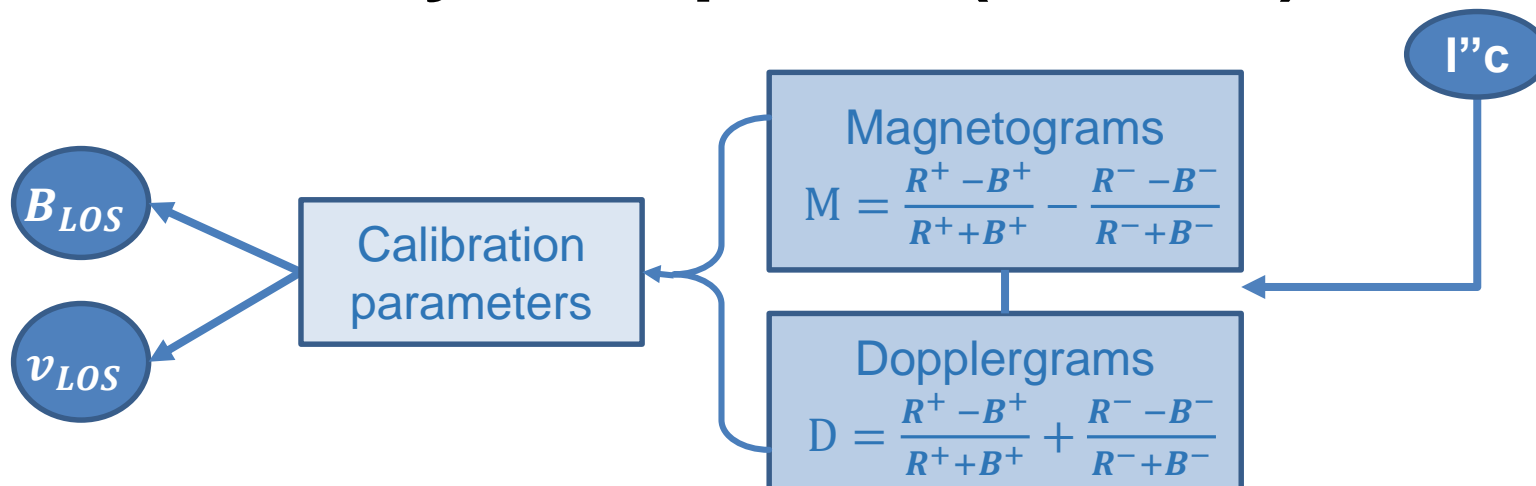
Calibration Pipeline (Level 1)



Calibration Pipeline (Level 2)



Analysis Pipeline (Level 3)



Results:

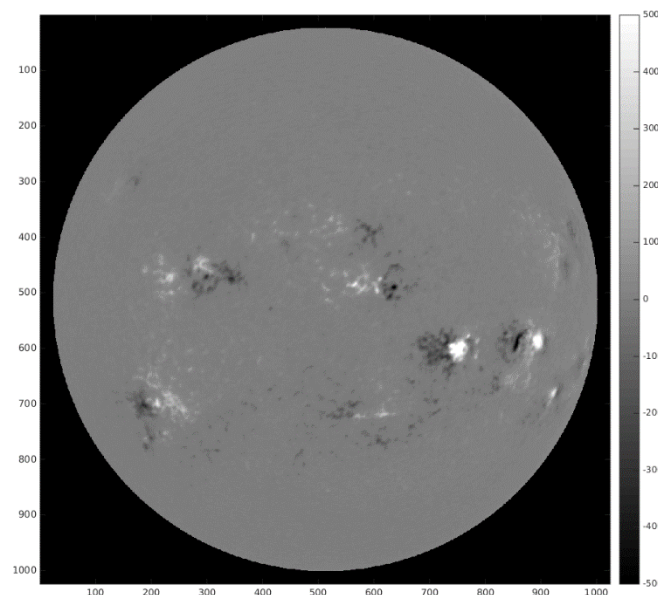
Magnetograms at two heights of the solar atmosphere, in

Na D2 (589 nm) \rightarrow h=600-700 km

K I (770 nm) \rightarrow h=300-400 km

which allow to evaluate the magnetic gradient along the Line-Of-Sight:

$$\nabla B_{LOS} \propto \frac{B_{Na}^{LOS}}{B_K^{LOS}}$$



Example of a LOS magnetogram in K channel. July 10, 2014 – 19:27:00 UT