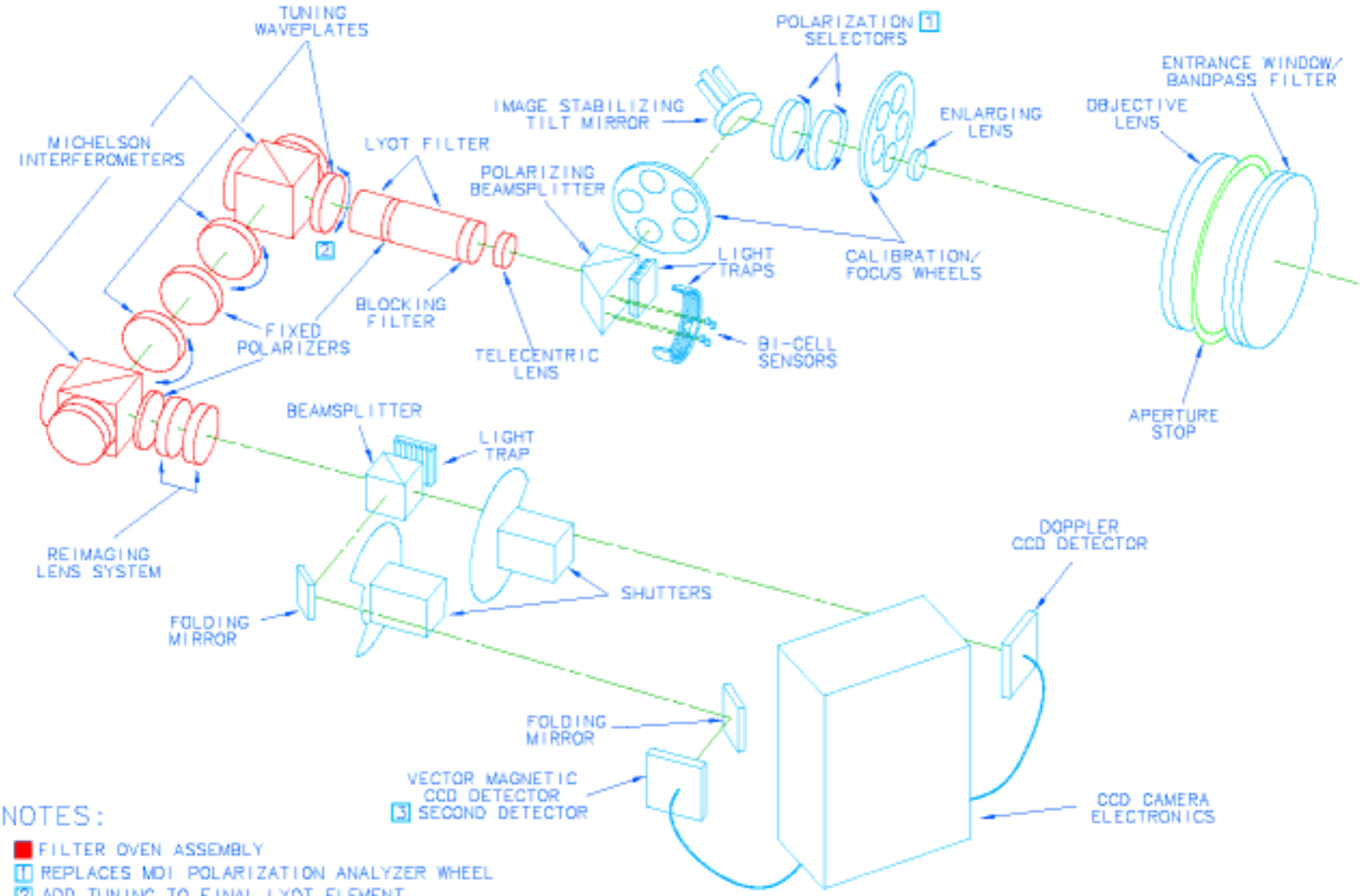
The Helioseismic and Magnetic Imager

SDO Project Interface Meeting

17 October 2002

HMI OPTICAL LAYOUT

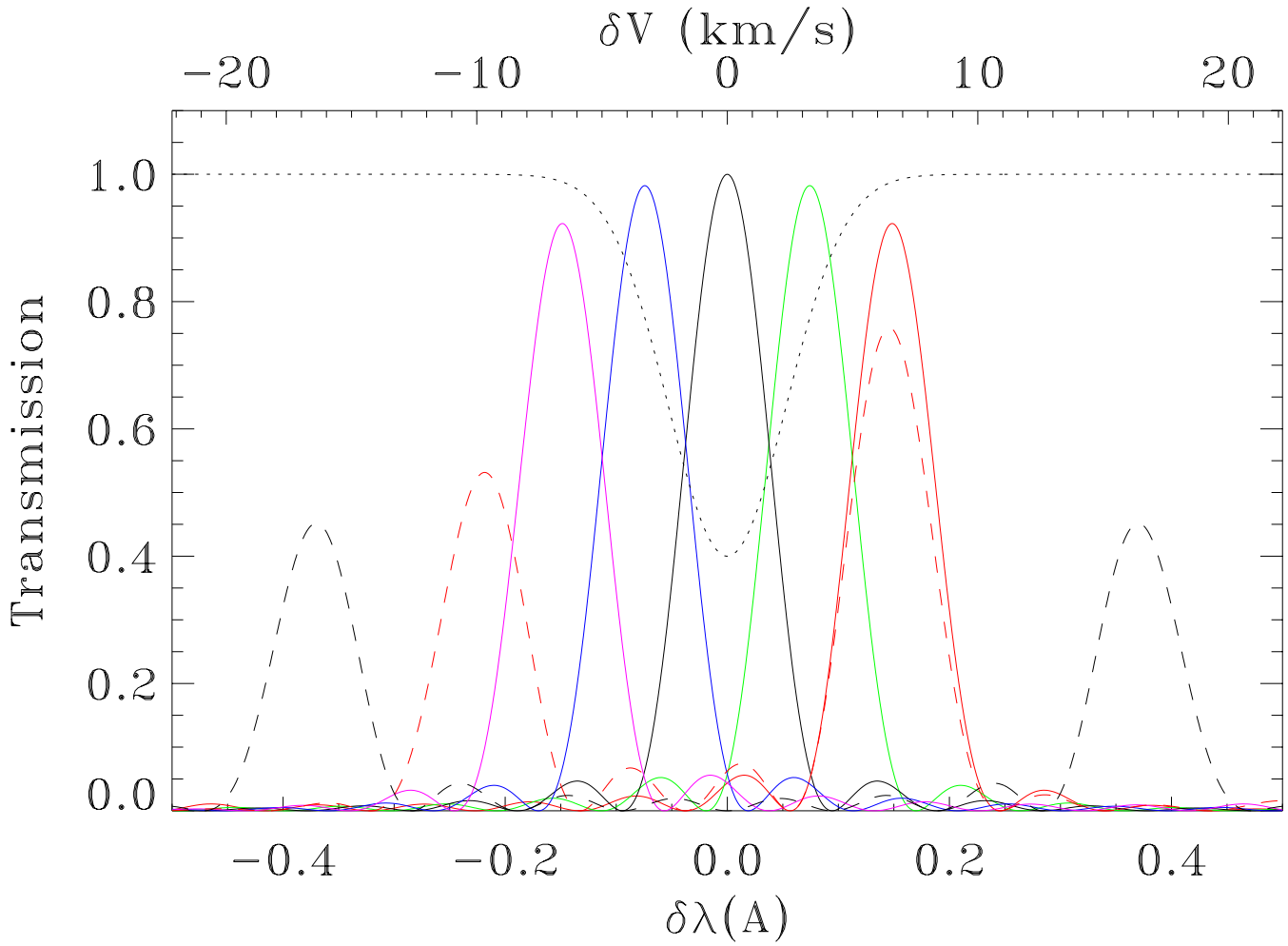


NOTES:

- FILTER OVEN ASSEMBLY
- [1] REPLACES MDI POLARIZATION ANALYZER WHEEL
- [2] ADD TUNING TO FINAL LYOT ELEMENT
- [3] SECOND DETECTOR

REV DATE 24MAR02

HMI Filter Profiles



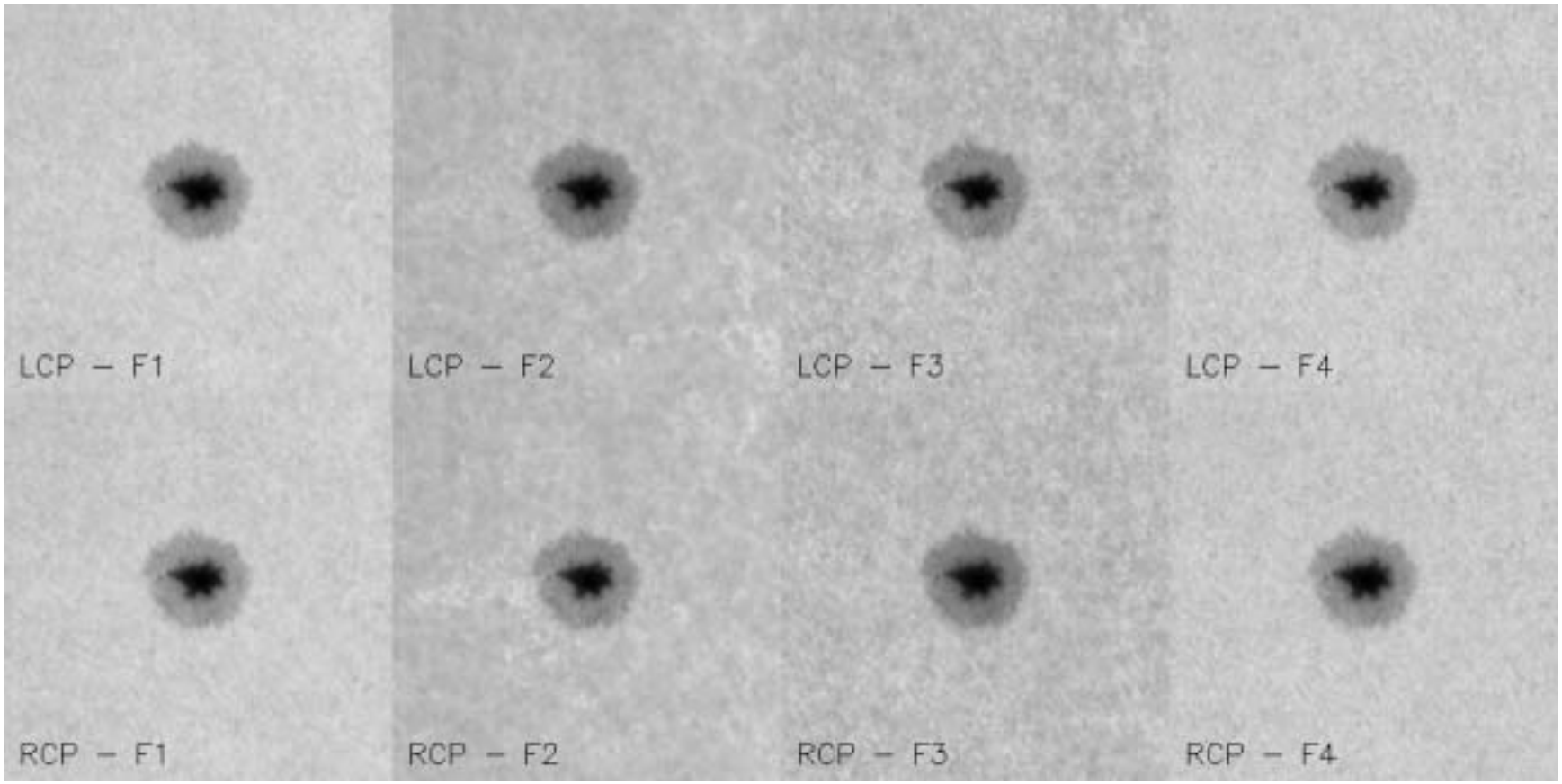
HMI Observing Sequence

Time (sec)	0	8	16	24	32	40	45	53	61	69	77	85
λ Tuning	I1	I2	I3	I4	I5	IC	I1	I2	I3	I4	I5	IC
Doppler Seq	L R	R L	L R	R L	L R	C	L R	R L	L R	R L	L R	C
Vector Seq	1 2	2 1	1 2	2 1	1 2	C	3 4	4 3	3 4	4 3	3 4	C

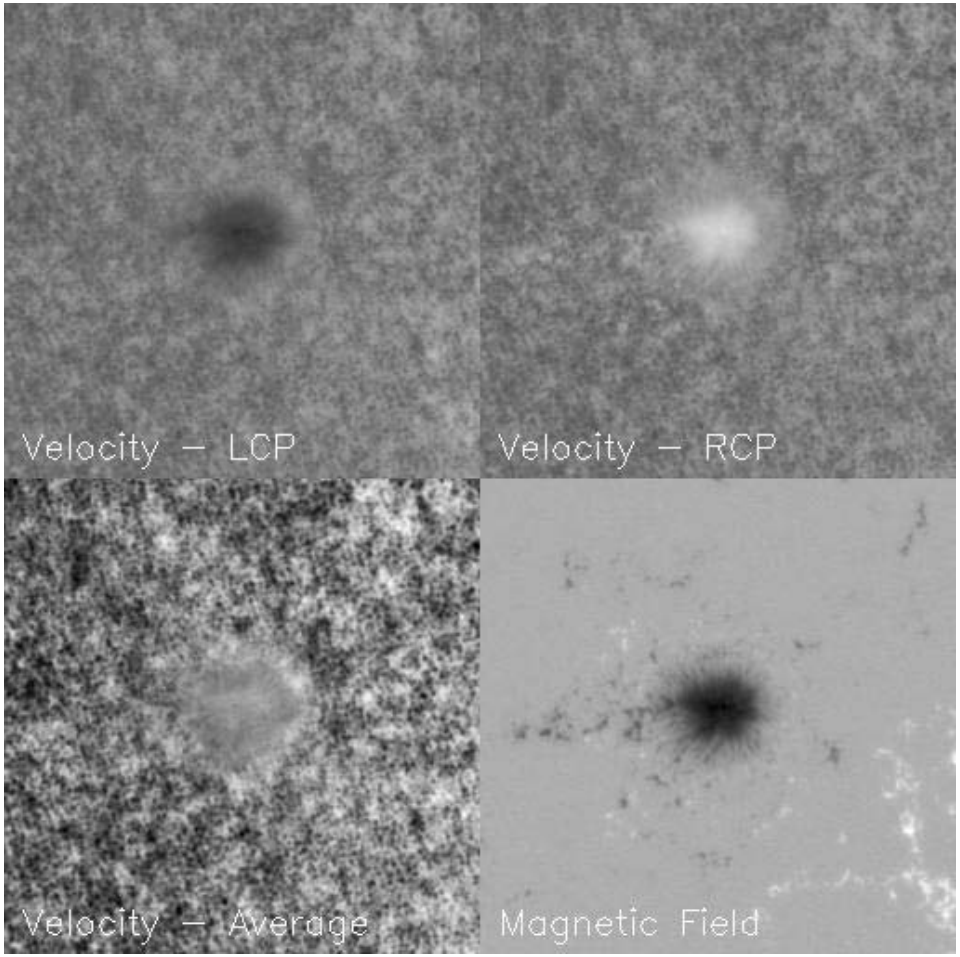
Polarization	L = I + V = LCP	R = I - V = RCP	1 = I + aQ + bV	2 = I – aQ + bV	3 = I + aU – bV	4 = I – aU - bV

Details of the HMI observing sequence: *Time* indicates the beginning of the exposures at a given wavelength. The *Wavelength Tuning* positions I1 through I5 are spaced evenly 75 mÅ apart, with I3 centered on the line (see Figure C.8). *Doppler Seq* and *Vector Seq* indicate the order and polarizations settings for the two cameras, with the states L, R, 1, 2, 3, 4 identified by *Polarization*. For $a^2=2/3$ and $b^2=1/3$, Q, U and V have identical noise equal to 0.22% in the continuum. IC is a continuum filtergram taken in linear polarization.

Sample MDI Filtergrams



Sample MDI Observables



Data Completeness

- Minimizing data loss is critical in order to insure the highest quality observables.
- A typical HMI filtergram will require about 10,000 packets of one kilobyte length.
- A loss of 10 packets per image results in a filtergram data completeness of 99.9%.
- With 10 filtergrams per observable, this could result in a 1% loss of the primary science image data.