Observations of flux emergence in a plage region

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Outline

- Observations
- Data reduction
- Analysis and results so far
- Outlook
Observations

27 May 2008 (SST+CRISP)
Fe-I 6302.5 Å
9 wavelength points (-200 to +200 mÅ) + 1 continuum position, Full Stokes mode (4 LC states).
Frame rate 36 Hz, exp time 16 ms, CCD r/o 10ms.
14 Frames/wl/LC
Observations
Data reduction

- MOMFBD (1 set=630 frames 21 seconds)
- Demodulated and corrected for telescope polarization
- Residual Cross-Talk (V to Q,U)
Analysis: Inversions

Inversion code: HELIX (Andreas Lagg)

M.E (Simple yet robust, no hydrostatic eq)

M.E results can be considered as an average of physical parameters along l.o.s.

Optimization process/finding global minima ensured by genetic algorithm called PIKAIA.
Analysis: Inversions

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Atmospheric parameters involved: B, inc, azi, vlos, vdop, eta0, damp, sgrad, fillfact

Free parameters: B, inc, azi, vlos, vdop, sgrad, eta0

Fixed parameters: damp, local straylight factor (0.6)

Parameters given initial values plus range
Results
$T=0$
$T=105 \text{ s}$
T=483s
$T=882s$
$T=1155s$
T=1764s
Observed vs fitted profile
Simulations vs Observations
Outlook

- New inversions after prefilter correction
- Depth dependent inversions
- Bright downflows
- Horizontal flows
- Estimating the Poynting flux
- Strengths of horizontal vs vertical fields