

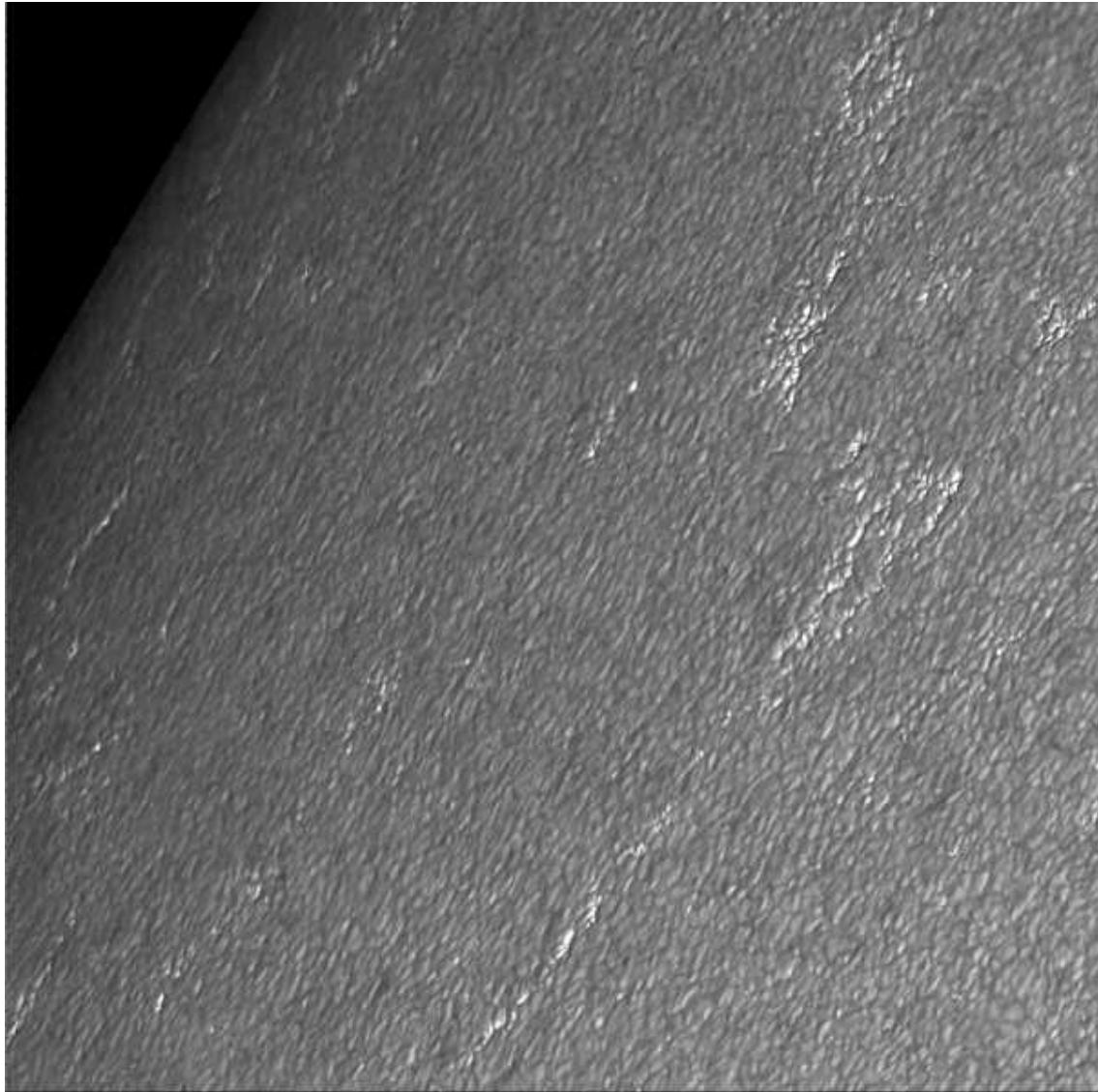
Science with VTF at DKIST (KIS internal workshop), July 19, 2019

DKIST Use Case UC-125

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1. Discovering magnetohydrodynamic fine structure of faculae



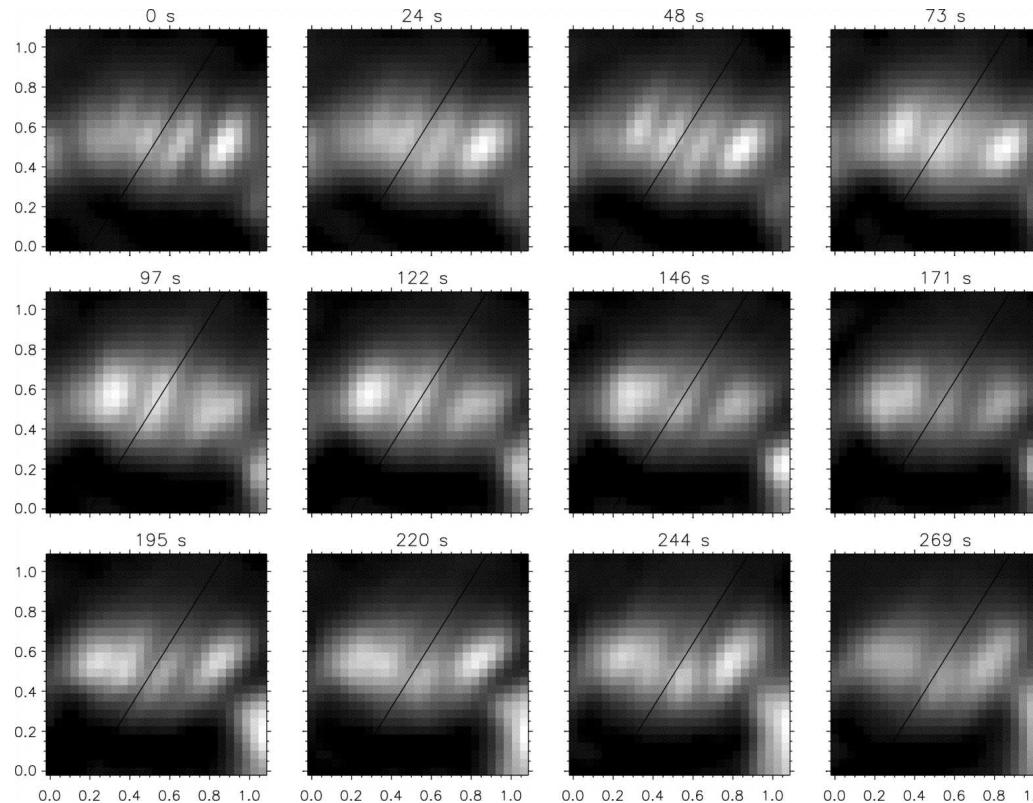
Speckle reconstructed
image of facular region
taken with the 1 m Swedish
Solar Telescope in the
continuum at 487.5 nm.
Field of view approximately
 $80'' \times 80''$.

*From Hirzberger & Wiehr
(2005), A&A 438, 1059*

1. UC-125 (cont.)

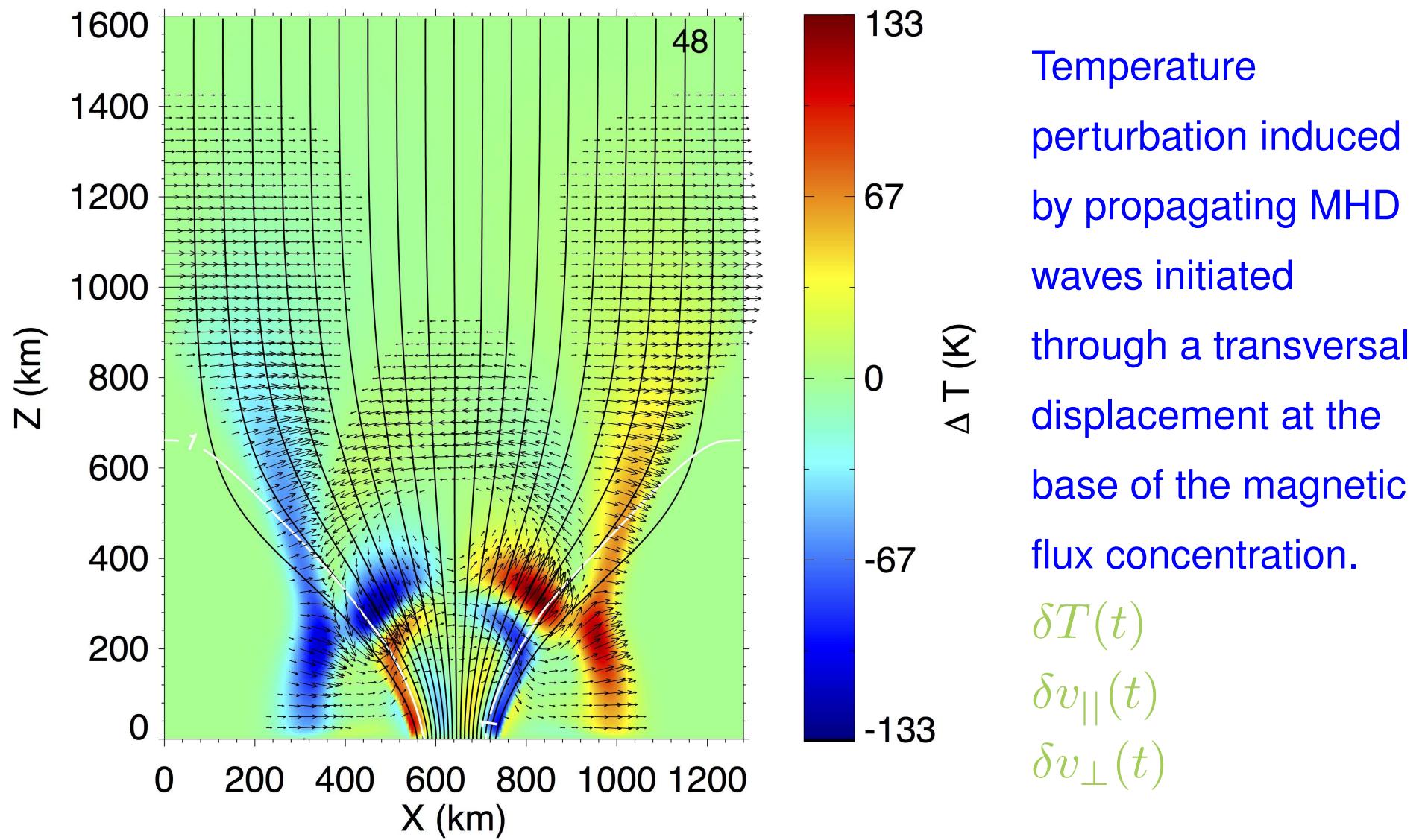
Temporal variability of facular magnetic field. Swaying flux tube?

De Pontieu et al. (2006), ApJ 646, 1405



Faulae provide us with the unique opportunity to see footpoints of fluxtubes
from the side!

1. UC-125 (cont.)



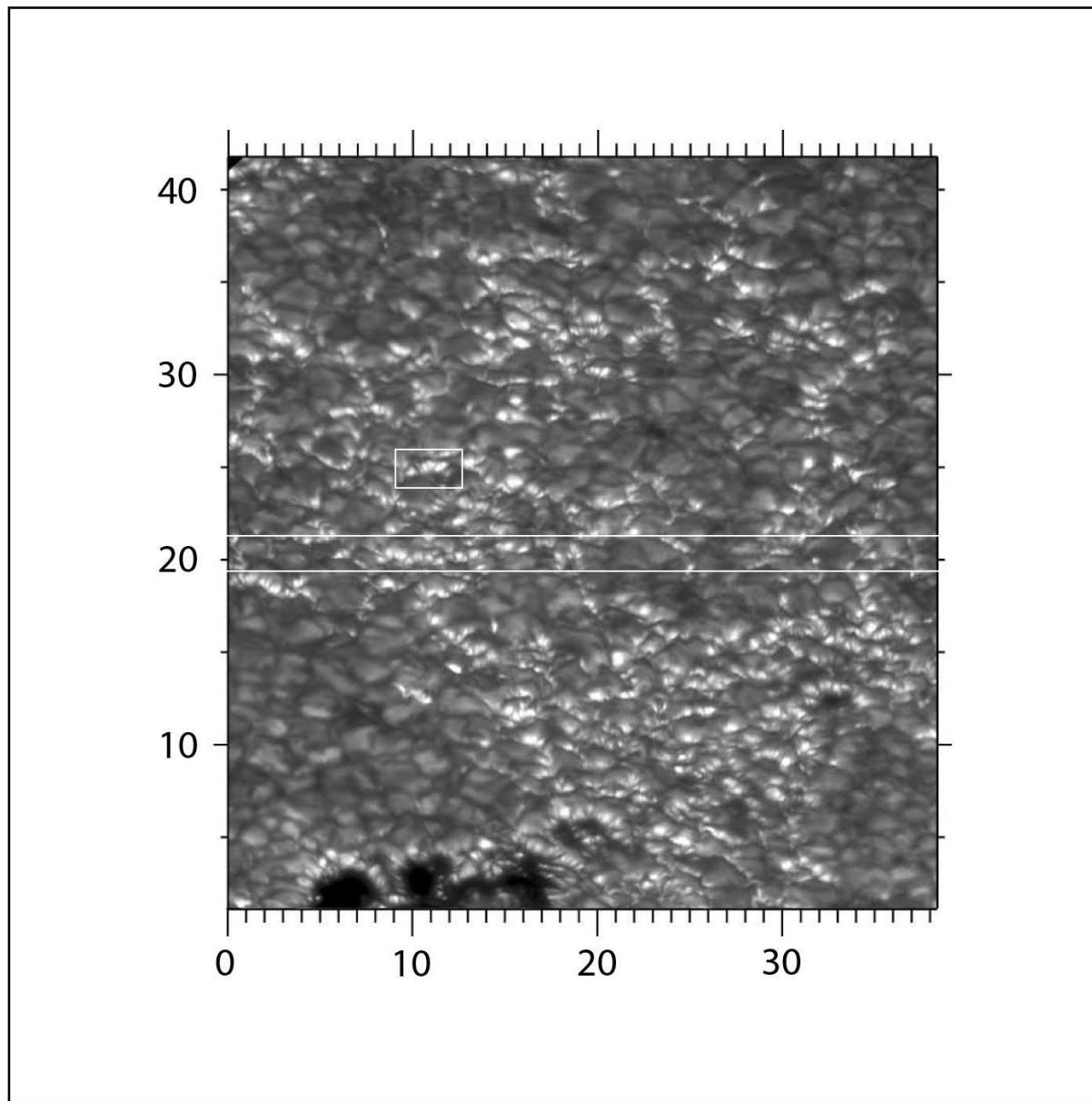
From *Vigeesh, Hasan & Steiner: 2009, A&A 508, 951*

2. Instrument set-up

Instrument	FOV	channel	λ [nm]	cadence	sensitivity	comment
VBI	$45'' \times 45''$	G-band	430.52	3.2 s	S/N = 209	$S/N = 209 \hat{=} \delta T = 10\text{ K}$
VTF	$60'' \times 60''$	Fe I	630.25	21 s	$P/I = 10^{-3}$	6 accumulations, 2 x 2 binning, 11 scan steps, $\Delta\lambda = 3.15\text{ pm}$
	$60'' \times 60''$	Ca II	854.21	1.87 s	S/N = 178	intensity alone, 1 accumulation, 11 scan steps, $\Delta\lambda = 10.68\text{ pm}$, 5 fast scans after every 21 s
ViSP	$2'' \times 75''$	Fe I	525.02	2.5 min	$P/I = 10^{-3}$	38 slit positions, $\Delta x = 0.053''$,
			524.71			slit width $0.053''$, $t_{\text{exp}} = 3.8\text{ s}$
NIRSP	$2.4'' \times 1.8''$	Fe I	1565	5 s	$P/I = 5 \cdot 10^{-3}$	$\delta B = 100\text{ G detectable}$

Foresee to sequentially observe 5 facular targets at $\mu \approx 0.6$, each for 20 min.

2. UC-125 (cont.)



Field of views of VTF
(outermost black frame),
VBI (approximately image
size), ViSP scan area
(white slit across image),
and DL-NIRSP (white
small frame).