

Dual-line spectral imaging of the chromosphere

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We compare imaging spectroscopy of a quiet-sun field of view in Ca II 854.2 nm and H α , obtained with IBIS at the Dunn Solar Telescope using adaptive optics. Basic profile measurements for the two lines show that they differ markedly in their rendering of the chromosphere. Nevertheless, both show evidence of chromospheric heating, particularly in and around network: H α in its line core width, Ca II 854.2 nm in its brightness. Shocks abound in internetwork. Submitted to A&A.

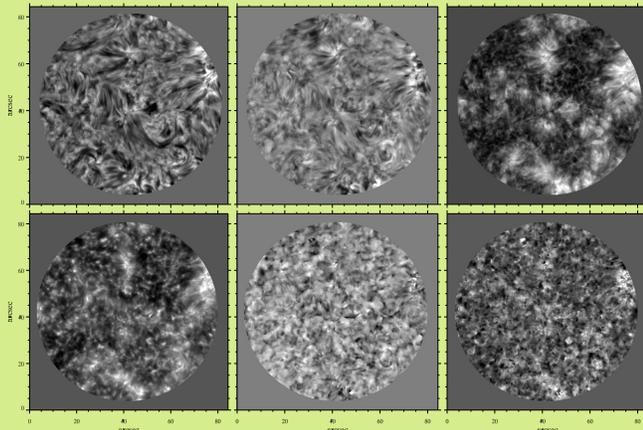
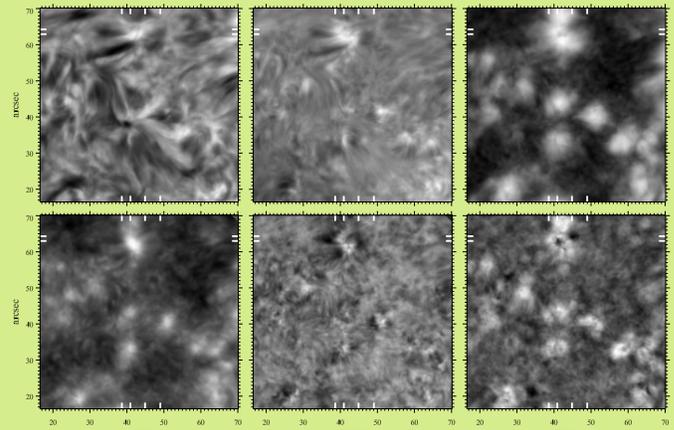
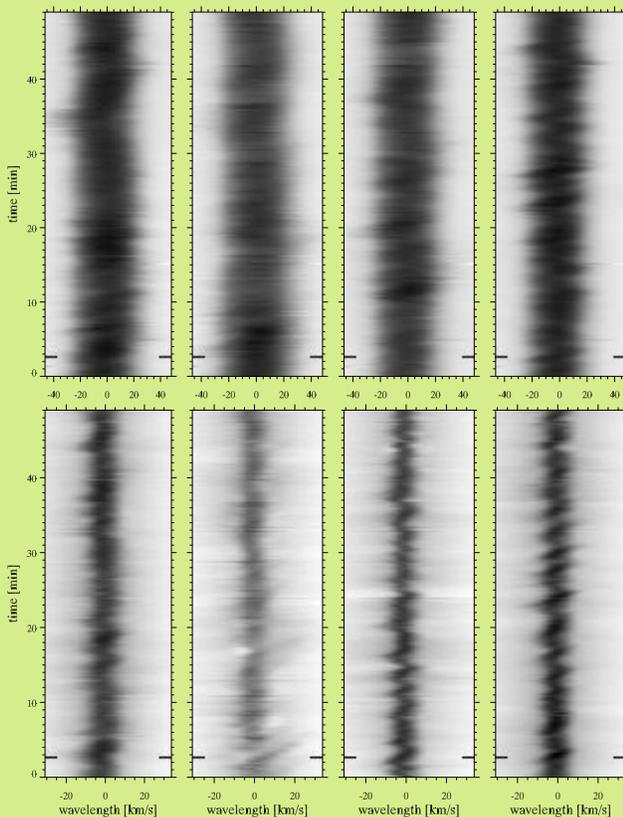


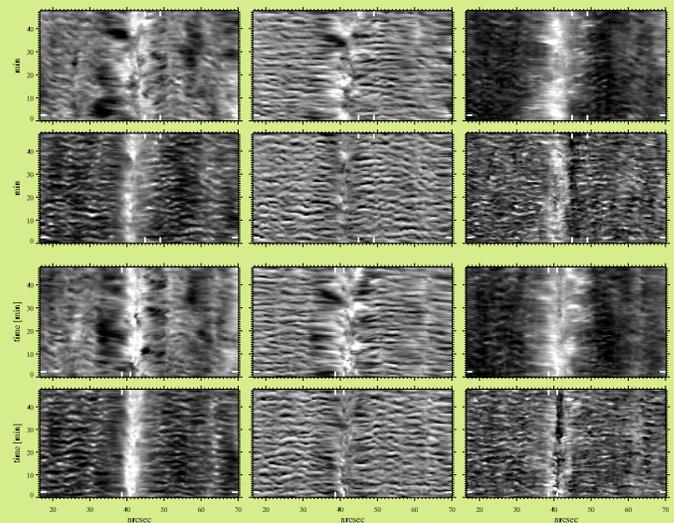
Image representations of line profile measurements at a moment of good seeing. Upper row: H α . Lower row: Ca II 854.2 nm. First column: minimum intensity per pixel. Second column: Doppler-shift of the profile minimum per pixel. Third column: line width at 50% core depth per pixel.



Temporal averages over the 48-min sequence duration for the central part of the field of view. Same layout as the first figure. The y-axis markers specify the cut locations for the slices below. They pass through a patch of network area and two dark patches of small Ca II 854.2 nm width in the last panel.



Spectrum-versus-time plots for H α and Ca II 854.2 nm at four pixels specified by markers in the next figures. The first two columns sample network, the others internetwork. The second and third columns sample dark blobs of small Ca II 854.2 nm width seen in the next figure. The greyscale is logarithmic. The black markers specify the time of observation of the first figure.



Space-time slices showing temporal behavior along the two cuts defined by the y-axis markers in the figure above, for the higher one in the upper half of this figure. The six panels per cut show the same quantities as in the first figure. The x-axis markers specify the four pixels, two per cut, sampled at left.

Note:

- similarity between mean H α core width and Ca II 854.2 nm brightness, due to heating
- dissimilarity between H α and Ca II 854.2 nm brightness – H α brightness is no temperature indicator
- weakening of Ca II 854.2 nm core width at maximal heating
- ubiquity of internetwork shocks, also in H α