Different time behaviour

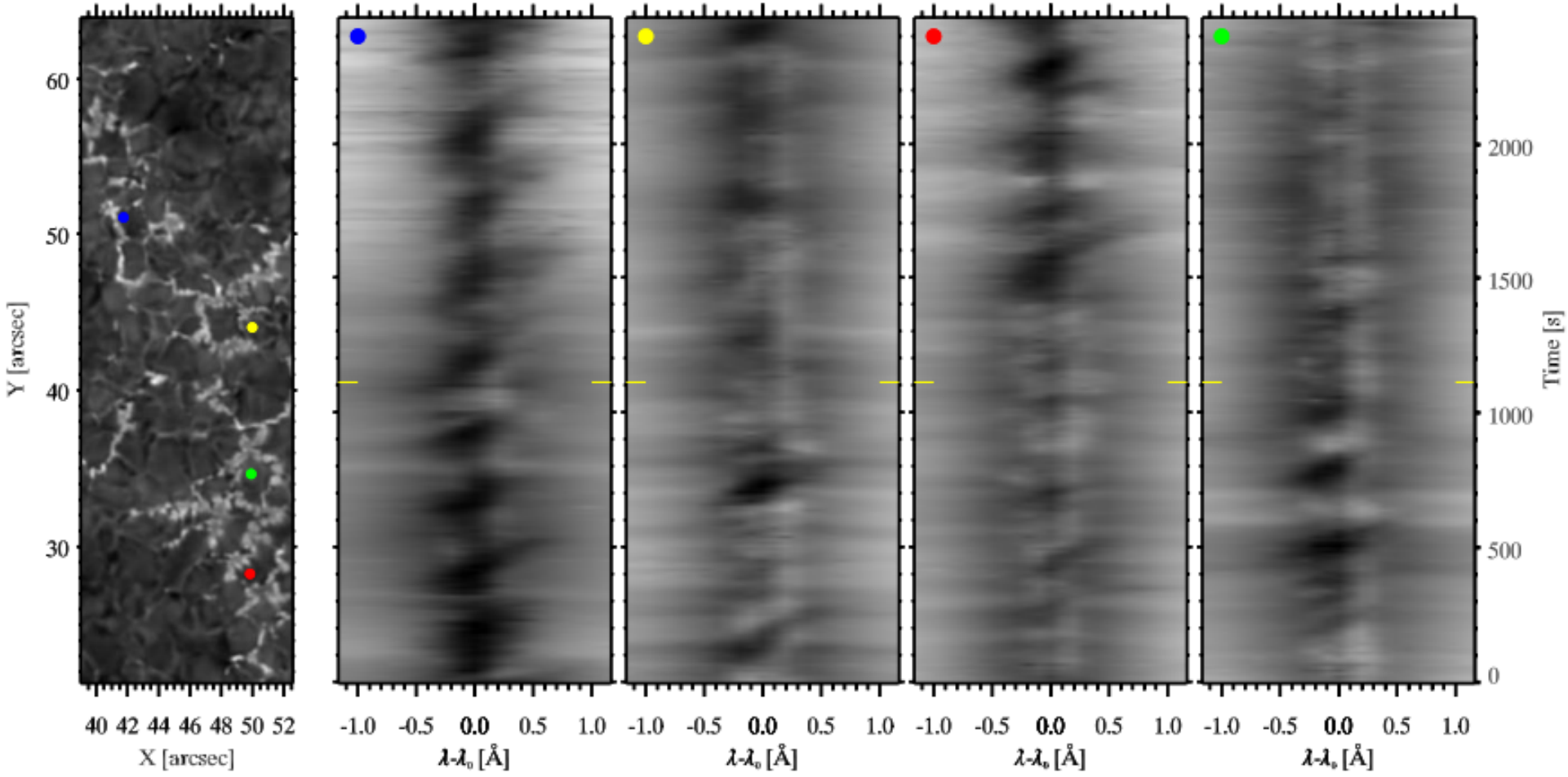
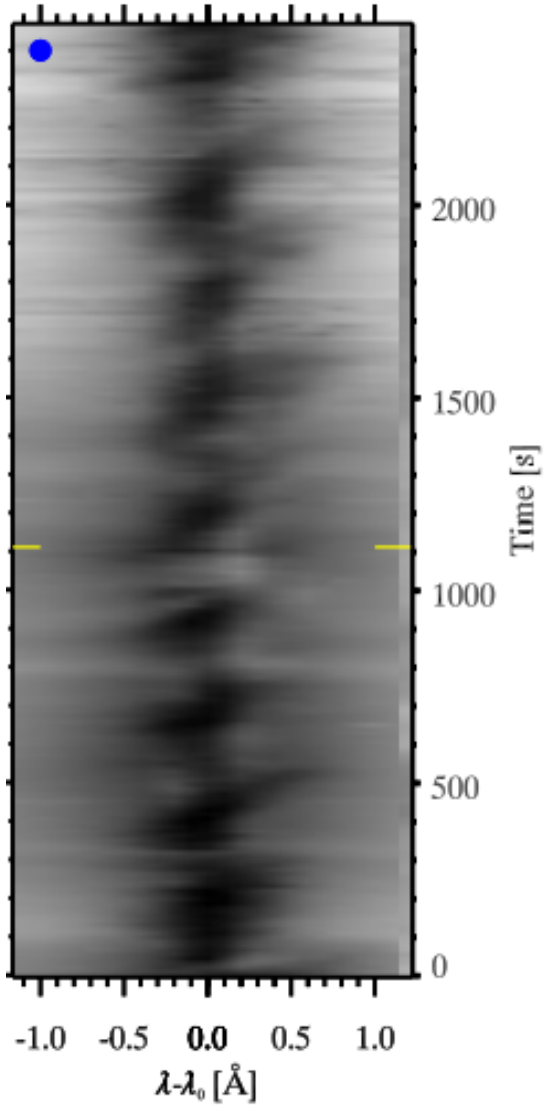


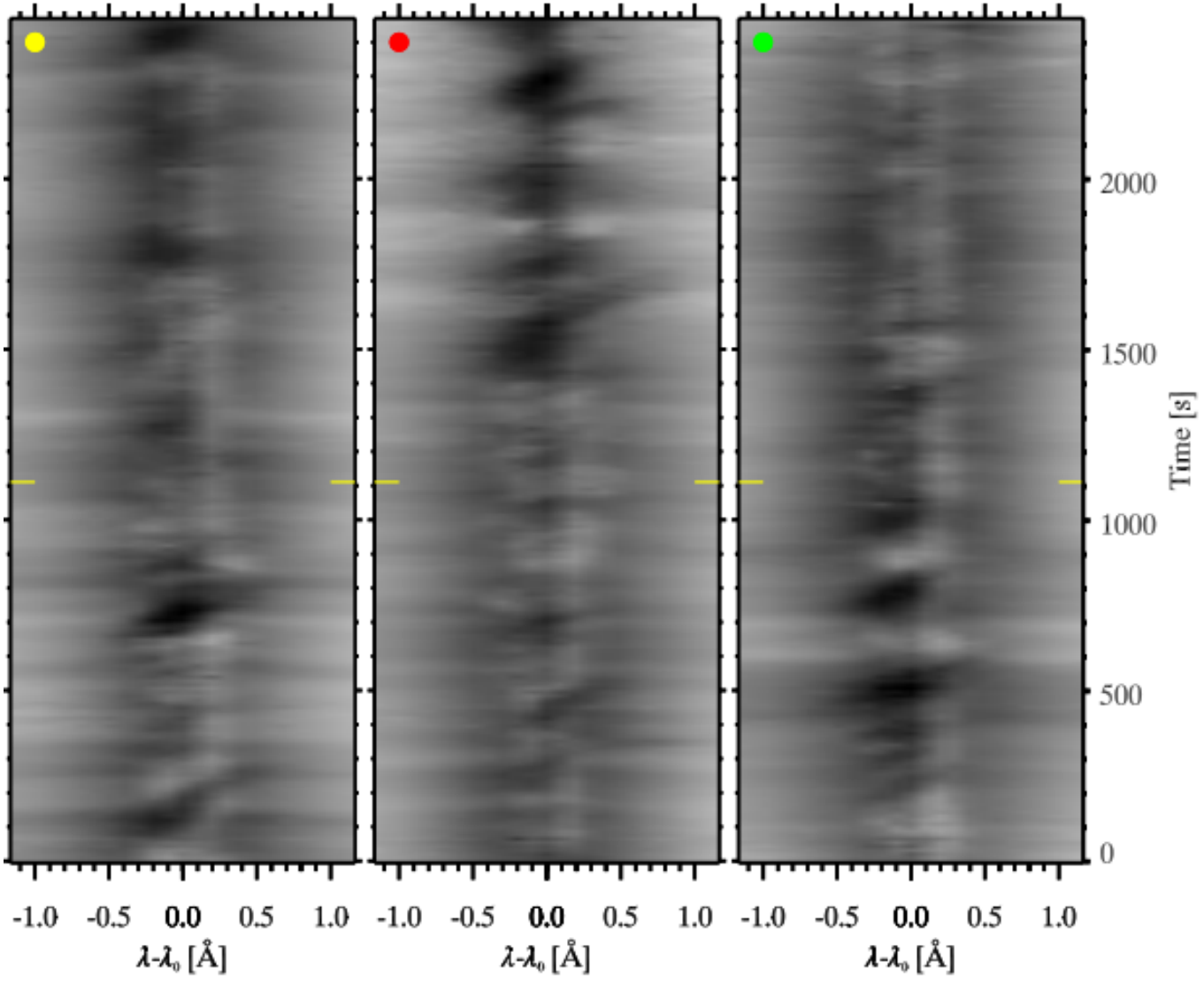
Figure 1: The second panel from left corresponds to a traditional absorption profile showing a shock-induced temporal pattern. The last three panels correspond to the time evolution of three RC profiles. The time of the image in the top left panel is indicated in the time slices with a yellow marker.

Different time behaviour - No RC profile



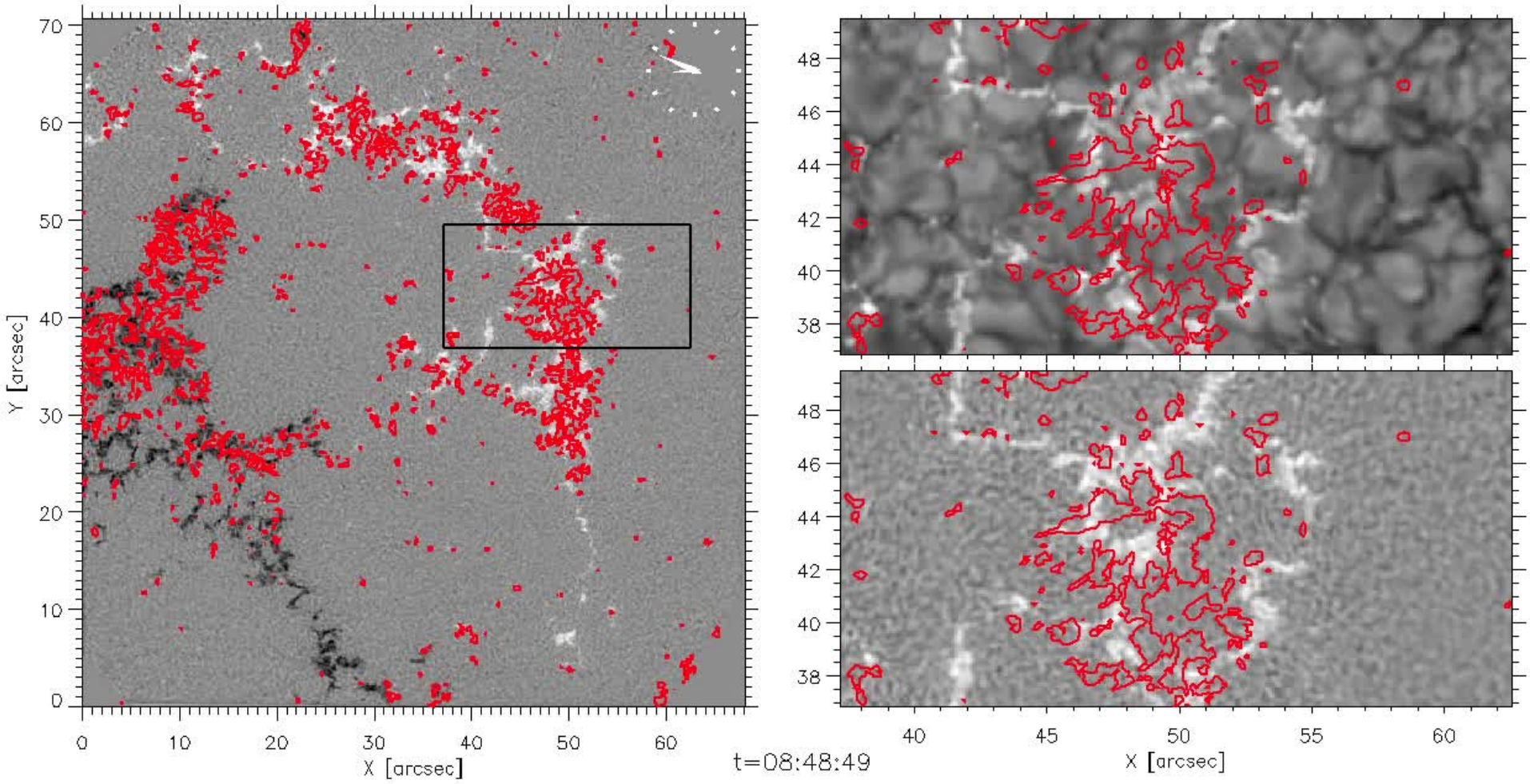
- succession of MHD shocks (characteristic strong absorption features)
- 2 brief RC moments between shocks

Different time behaviour - RC profile

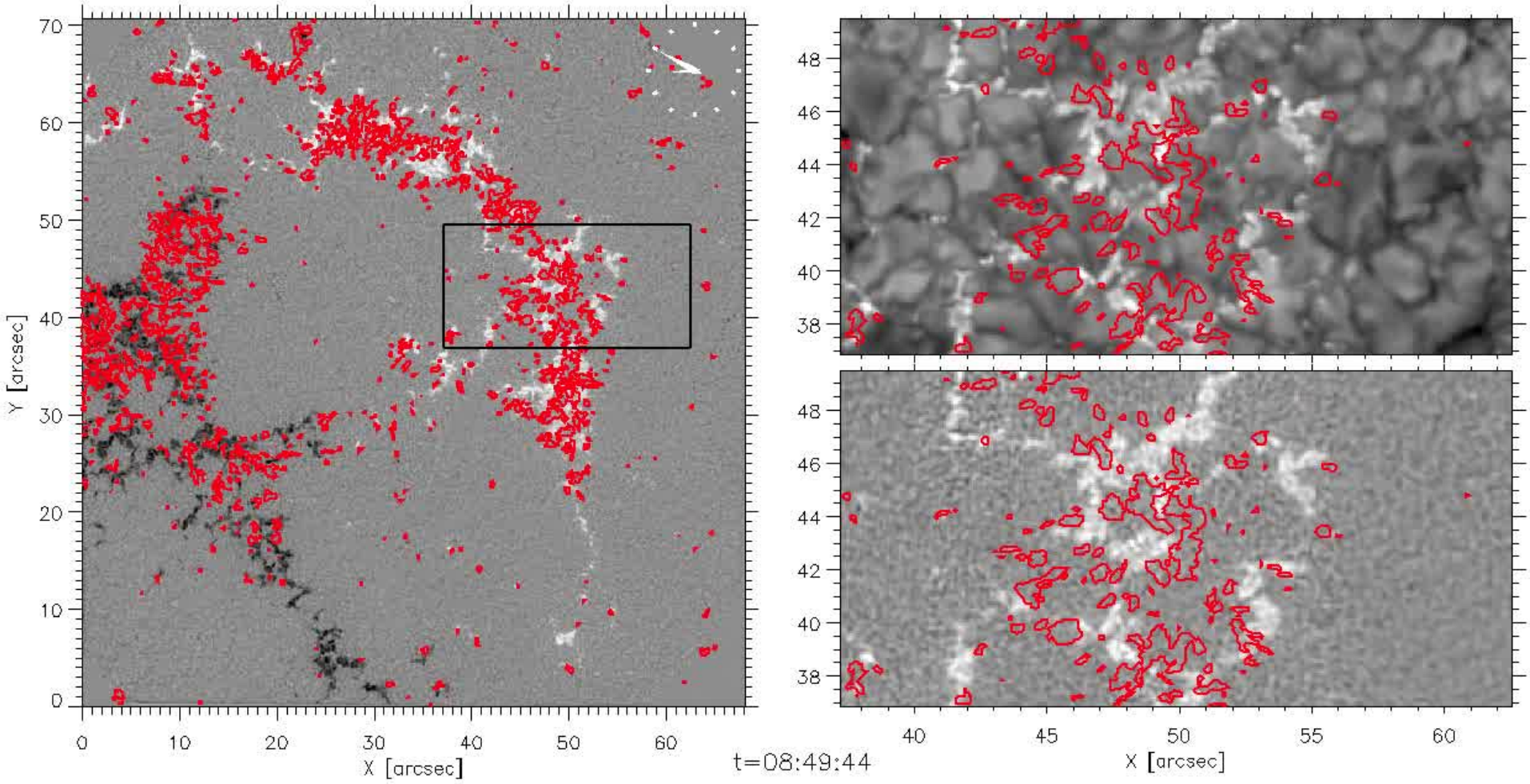


- RC emission for most of the series
- occasional shock induced absorption
- imprint of red emission lobe at $+194\ m\mathring{A}$ noticeable throughout time series, but not for the blue lobe

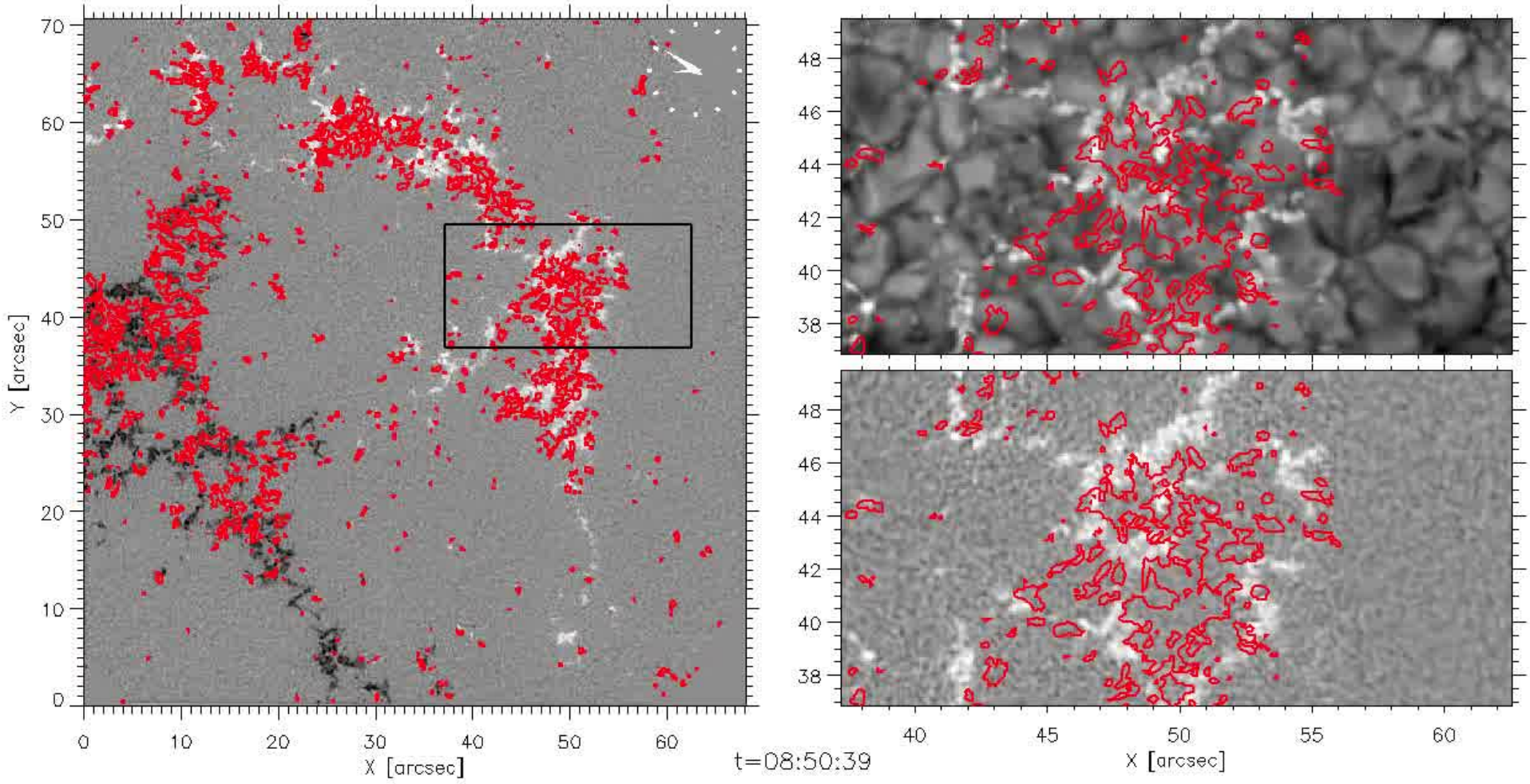
Frames from Fig.2 animation movie



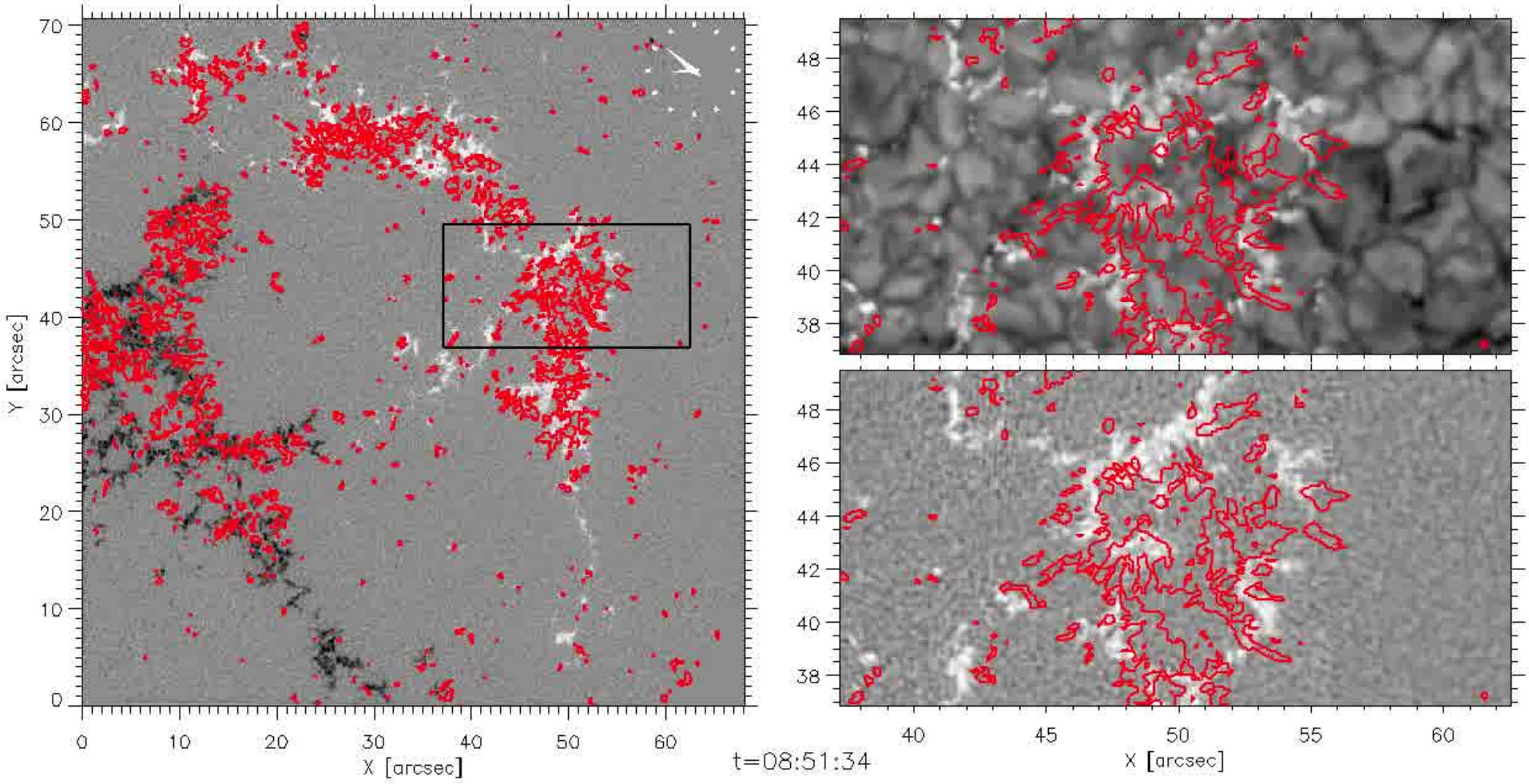
Frames from Fig.2 animation movie



Frames from Fig.2 animation movie



Frames from Fig.2 animation movie



Frames from Fig.2 animation movie

- contiguous and/or coherent spatial regions that contain RC profiles with typical spatial and temporal scales of the order of 0.5 arcsec and 1-2 minutes.
- These regions change shape and move about within the plage region

Autocovariance timescale

$$f(\vec{x},t) = \begin{cases} 1 \text{ if the point } \vec{x} \text{ has a RC profile:} \\ \qquad \text{number of zero-crossings of } \frac{dI}{d\lambda}(\vec{x},t) > 1, \\ 0 \text{ if the point } \vec{x} \text{ does not have a RC profile:} \\ \qquad \text{number of zero-crossings of } \frac{dI}{d\lambda}(\vec{x},t) = 1 \end{cases}$$

- autocovariance timescale at $\vec{x} = FWHM(f(\vec{x},t),t)$
- seeing deformations, jitter, and proper motions have **smaller** lifetimes than points with RC profile
- remove these effects by rebinning the data starting from 1x1 to 16x16 pixels (timescale increases until there is no more difference from 8x8 to 16x16 pixels both showing a timescale of 80s)
- timescale 1-2 minutes and spatial scale 8 pixels (0.5 arcsec)

Autocovariance timescale

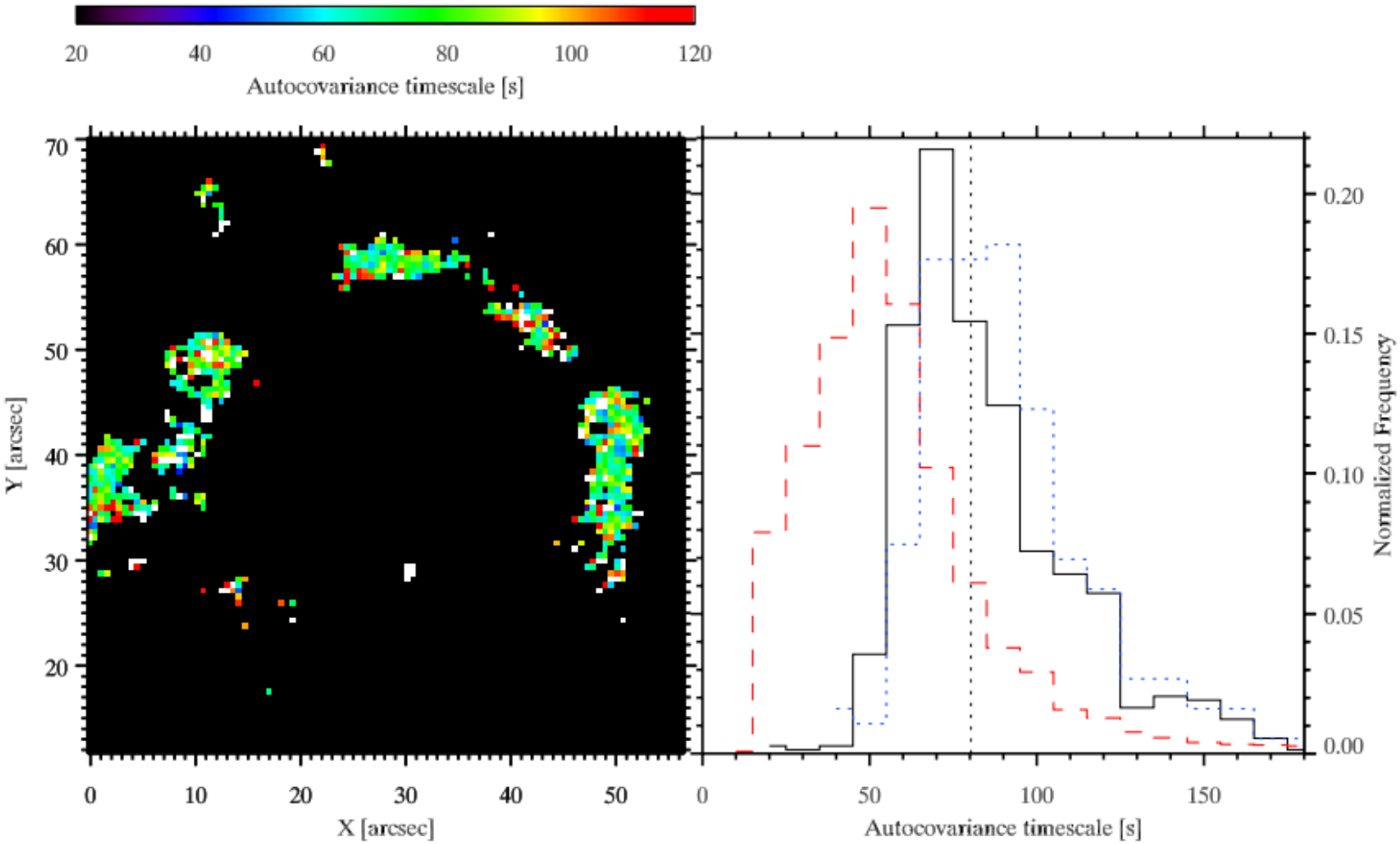


Figure 2: **Left:** map of the autocovariance timescale (8x8 rebinned) **Right:** a histogram of autocovariance timescales for locations with RC profiles, using the original data (dashed-red), 8x8 (solid-black), and 16x16 rebinning (dotted-blue). The vertical black-dotted line indicates the median autocovariance timescale:81s.