Supporting Online Material for

Detection of Emerging Sunspot Regions in the Solar Interior

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Published 19 August 2011, *Science* **333**, 993 (2010)
DOI: 10.1126/science.1206253

This PDF file includes:

Figs. S1 to S7

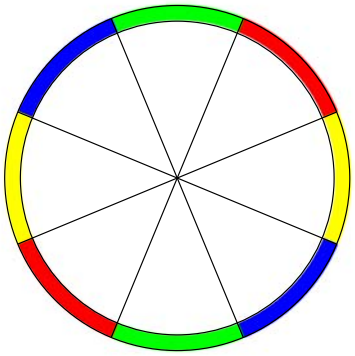

Fig. S1

Schematic representation of the measurement scheme. The oscillation signal is averaged inside each arc, and cross-covariances are computed between arcs of the same color. For simplicity only arcs with size of 45 degrees and one specific orientation are shown here.

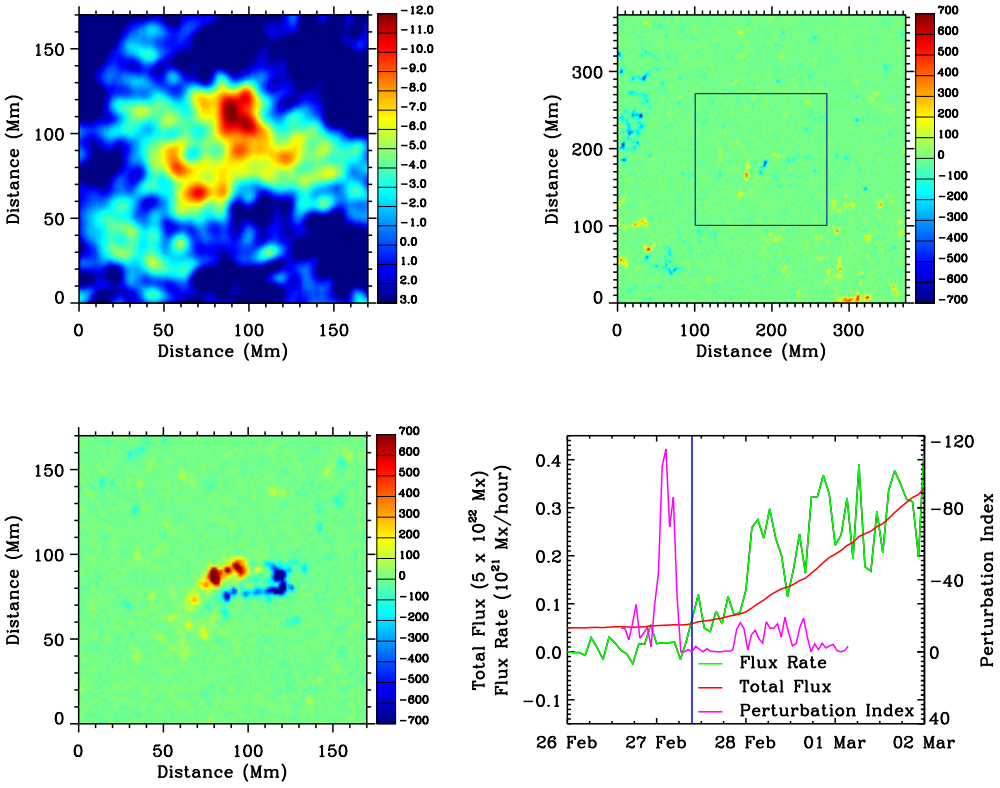

Fig. S2

(**A**) Mean travel-time perturbation map (in units of s) of AR 8171 at a depth of 42 - 75 Mm, obtained from an 8-hour dataset centered at 04:30 UT 27 February 1998. (**B**) Photospheric magnetic field (in units of G) at the same time as panel A. The whole map corresponds to the region where the computations were carried out while the squared area at the center corresponds to the region shown in panel A. (**C**) Photospheric magnetic field (in units of G) at the same location as panel A but 24 hours later. (**D**) Total unsigned magnetic flux (red line) and magnetic flux rate (green line) of AR 8171. The vertical blue line marks the start of emergence. The pink line shows the temporal evolution of the perturbation index (in units of 125 s Mm^2), which is defined as the sum of travel-time perturbations with values lower than -5.4 seconds, within the signature of panel A.

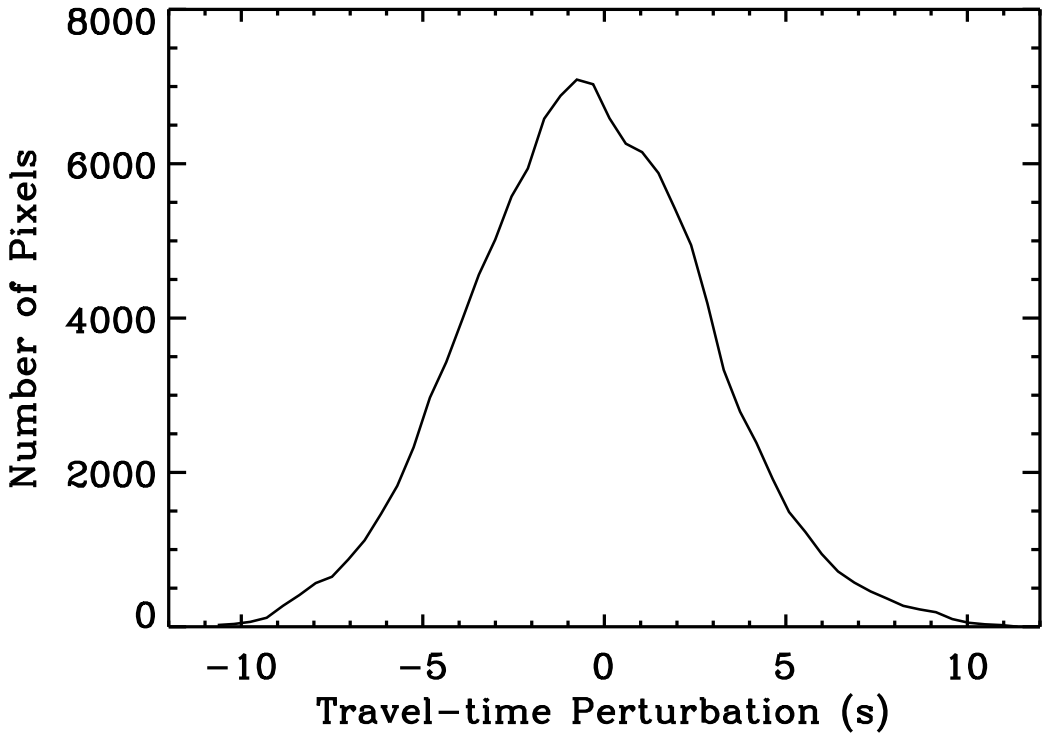

Fig. S3

Distribution of travel-time perturbations measured in 9 quiet-Sun regions. The standard deviation of these measurements is 3.3 s.

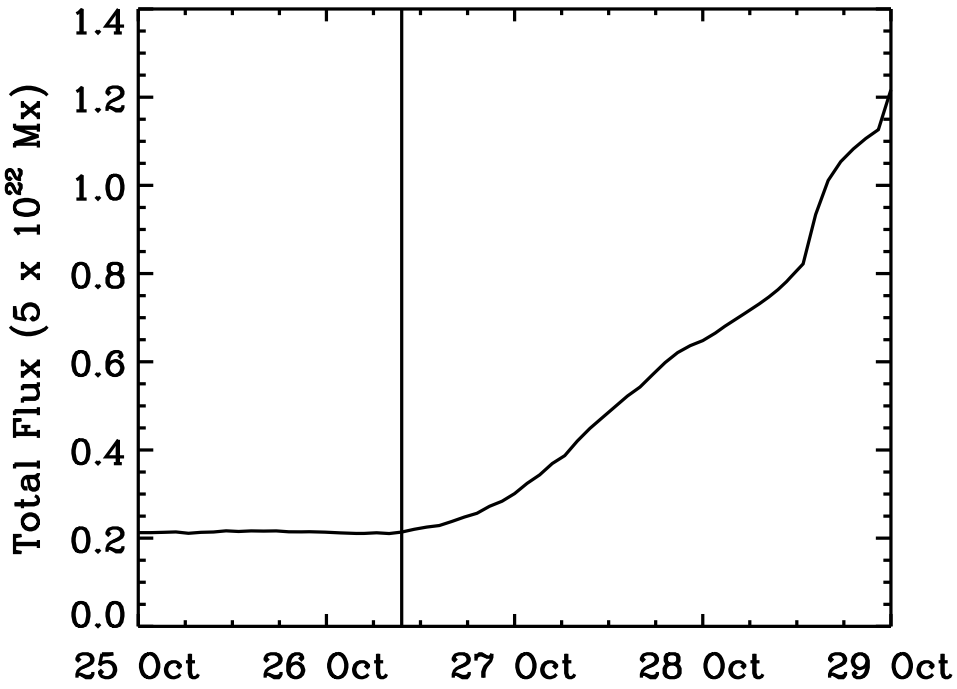

Fig. S4

Total unsigned magnetic flux computed in the region where the analysis is carried out for AR 10488. This region is shown in Figure 2B of the manuscript. The vertical line marks the start of the magnetic field emergence in the photosphere.

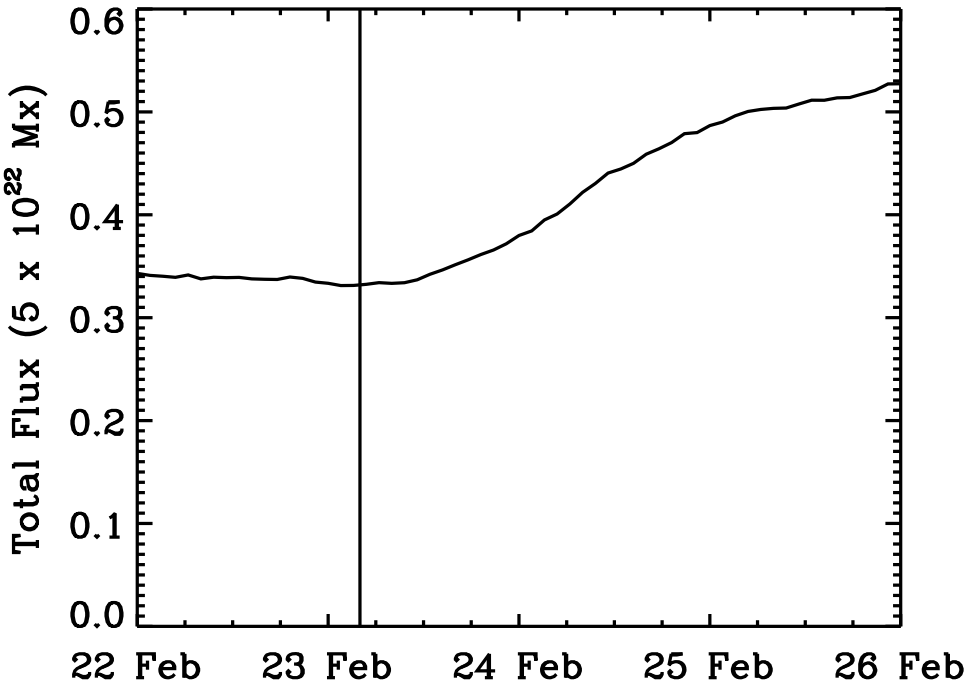

Fig. S5

Total unsigned magnetic flux computed in the region where the analysis is carried out for AR 8164. This region is shown in Figure 3B of the manuscript. The vertical line marks the start of the magnetic field emergence in the photosphere.

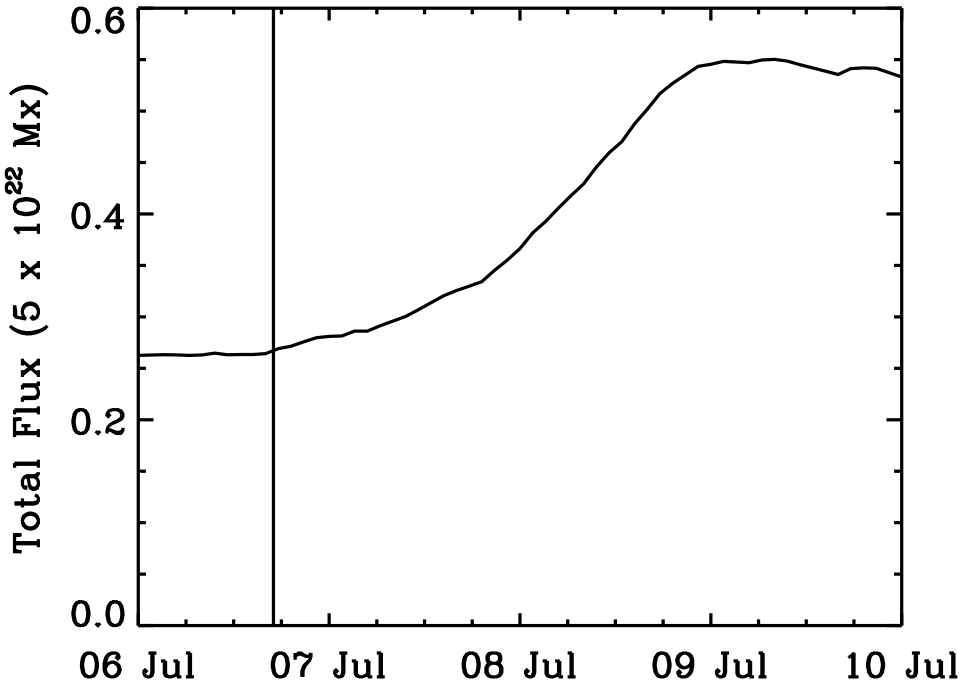

Fig. S6

Total unsigned magnetic flux computed in the region where the analysis is carried out for AR 7978. This region is shown in Figure 4B of the manuscript. The vertical line marks the start of the magnetic field emergence in the photosphere.

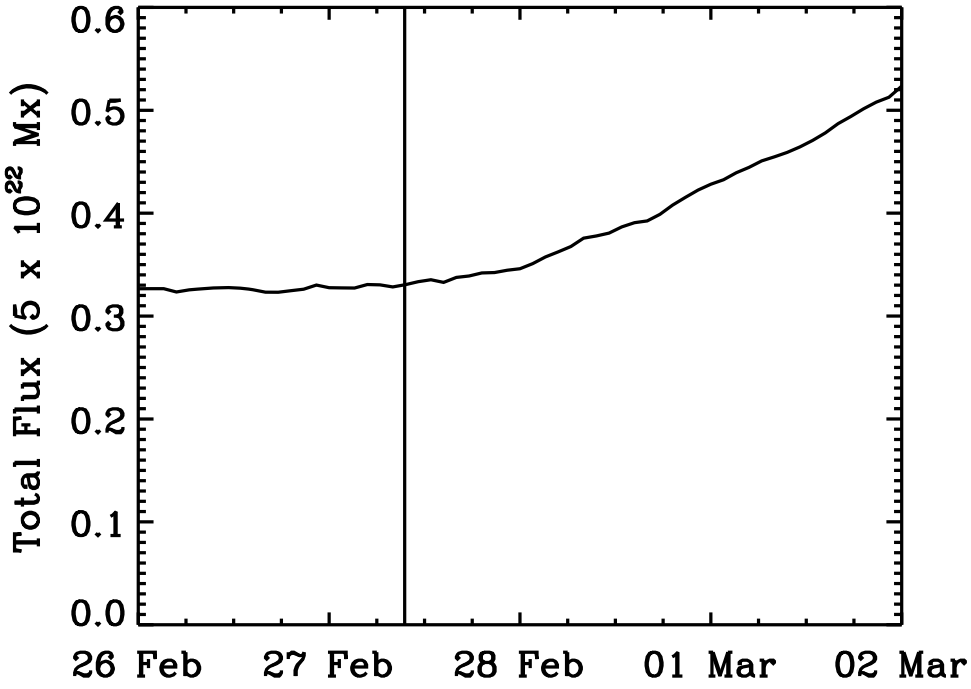

Fig. S7

Total unsigned magnetic flux computed in the region where the analysis is carried out for AR 8171. This region is shown in Figure S2B. The vertical line marks the start of the magnetic field emergence in the photosphere.