

## **Exploration of subsurface conditions around AR486 using time-distance helioseismology**

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We use the method of time-distance helioseismology to investigate the subsurface conditions surrounding the active region AR486. This active region was the source of several extremely large flares during the so called Halloween" events of October 2003. In time-distance helioseismology travel times for waves propagating through the solar interior are derived from cross-correlating the observed surface motion of the Sun. Here we present maps of subsurface motions obtained from the differences between travel times for waves propagating in opposite directions. Interesting changes in the flow patterns are seen in connection with flare activity. We also examine the effect the presence of magnetic field has on the resulting cross correlation. Large amplitude asymmetries between waves propagating in opposite directions can be observed in connection with active regions. The asymmetries can be attributed to suppression and absorption of seismic waves by the magnetic field. Unraveling the effects of magnetic field on the waves from the effects of sound speed perturbations and flows are one of the major challenges facing time-distance helioseismology.