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Helioseismic Imaging of Solar Active Regions

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We use time-distance helioseismology to probe the structure and dynamics of active regions in the Sun's interior. Using uninterrupted observations of solar oscillations from the SOHO/MDI Dynamics Program we obtain 3D maps of sound-speed variations and plasma flows for several active regions during their emergence and evolution, including some of the largest and most active regions of this solar cycle, NOAA 9393 and 10486/10488. We compare the helioseismology results with the magnetic field structure and evolution, and investigate the dynamics of subphotospheric flows during the periods of strong flares.