

Helioseismological Diagnostics of Solar Activity

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Solar dynamo models rely on helioseismology for a quantitative description of internal motions. Rotation and meridional circulation, shearing and vortical motions have been measured inside the Sun. While it is clear that flows in the convection zone vary in connection with the solar activity, it has proved difficult to identify structural variations deep in the interior. Wave-speed perturbations are seen immediately below sunspots and active regions, but they remain difficult to interpret. Future progress will depend on our ability to understand how the magnetic field affects wave propagation, either directly or indirectly. As a new step in this direction, I will present MDI observations of the scattering of f modes by network magnetic flux tubes (work done in collaboration with T.L. Duvall and A.C. Birch).