Geophysical Research Abstracts, Vol. 8, 10154, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10154

Large-scale solar interior dynamics during 1996-2005 from time-distance

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Time-distance helioseismology has been used to study the large-scale solar interior dynamics, including rotational and meridional flow velocities, as well as vorticity distributions as functions of solar latitude and radius. It is found that these solar properties evolve together with solar cycles, e.g., residual meridional flows, defined as the residuals after a meridional flow profile of the solar minimum year is subtracted from the meridional flow profiles of other years, display converging flows toward the solar activity zones, and move towards the solar equator with evolution of the solar cycle. Interior large scale flows around large active regions are also studied, and their possible relations with major solar flares are also discussed.