oscillation data from the Stanford Solar Observatory (Delache & Scherrer 1983, Nature 306, 651) and the Crimean Astrophysical Observatory (Severny et al. 1984, Nature 307, 247). Since the nonradial g-modes are very sensitive to the interior structure of a star, the very good agreement of the theoretical periods of oscillation for modes with \( l = 1 \) and 2, in particular, with the observations give strong support for the previous conclusion that the Sun has a small, high-Z, iron-like core.

The points \( T_{\nu,n}(l(l+1))^{1/2} \) versus \( s = n + 1/2 - l/4 \) are also presented as well as additional eigenvalues for modes of oscillation with periods between 37 and 580 min to supplement the above results in Table 1 of (Rouse 1984 (submitted)). Present results are compared with published periods of oscillation for two standard solar models.

42.07
Observations of Solar Velocity Fields With Large-Format CCD Cameras at the Mount Wilson Observatory

E.J. Rhodes, Jr. (USC and JPL), A. Cacciani (U. Rome)
S. Tomczyk, R.K. Ulrich (UCLA), P. Dumont (USC) and R.F. Howard (NSO)

Two large-format CCD cameras have recently been employed at the Mount Wilson Observatory to record full-disk solar Dopplergrams. The first camera, having 800x800 pixels, has been employed with a magneto-optical filter to record Dopplergrams of the entire visible solar hemisphere. A short time series of these Dopplergrams, having a spatial resolution of 2.8 arcseconds, was recorded on June 1, 1984. The magneto-optical filter was first tuned 125 mA to the red of the centers of the Na D lines and a filtergram was recorded. The filter was then tuned to 125 mA to the blue of the line centers and a second filtergram was recorded. Computer processing at JPL's Image Processing Laboratory then registered the two filtergrams to a common center and computed the velocity at each pixel from the normalized difference of the two filtergrams. Laboratory tests were also conducted at JPL which demonstrated that the numerical integration of successive CCD exposures does in fact yield the theoretically-predicted improvement in signal-to-noise ratio. Consequently, a second CCD camera system, this one having 1024x1024 pixels is currently being installed for permanent use at the Mt. Wilson 60-foot solar telescope. This new CCD camera will have a readout rate of 800,000 pixels per second, so that a full CCD frame will be read out in 1.25 seconds. The raw filtergrams output from this CCD camera will be digitally integrated in a CSPI Mini-MAP high-speed array processor before conversion to solar Dopplergrams. Results from the June, 1984, run will be presented and a description of the new 1024x1024-pixel data acquisition system will be given. This research has been supported in part by NASA Grant NAGW-13 to USC, by the JPL Director's Discretionary Fund, and by NASA contract with the Jet Propulsion Laboratory, Calif. Institute of Technology.

42.08
Magnetic Field Inclination and the Double Return Flux Sunspot Model

J. K. Lawrence and M. Zhu (SFU/CSUN)

The formalism of the magnetohydrostatic theory of sunspots due to Osherovich has recently been extended to include double-return-flux models. We here present numerical solutions for the static magnetic field of a sunspot of this type using an observed plasma pressure distribution. The results are compared to those of simpler magnetohydrostatic models. The inclination of the sunspot magnetic field at the photosphere is calculated as a function of radial distance from spot center, and the results are compared to observations.

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