is about 0.65. Also the distribution of rotational velocities is examined.

Umbral Chromospheric Cavity Oscillations for Slow Mode Magneto-Acoustic Waves

Yun, Hong Sik and Lee, Jeong Woo
Department of Astronomy, Seoul National University

Umbral chromospheric resonant cavity for slow mode magnetoacoustic waves is considered to interpret 3 min. oscillations observed above sunspots. The resonance cavity has been investigated by calculating the transmission coefficients of the waves propagated through the umbral photosphere and chromosphere into the corona with various periods. For this calculation we made use of multi-layer approximation by representing the atmosphere by a number of separate layers with temperature varying linearly with depth within the individual layers. The medium is assumed to be compressible and permeated with a strong uniform magnetic field parallel to the gravity.

The resonant periods and transmission coefficients calculated for various umbral chromospheric models are presented and their model dependent characteristics are discussed.

Distribution of Zodiacal Dust Particles in the Ecliptic Plane

Hong, Seung Soo, Um, In Kyung and Kwon, Suk Minn
Department of Astronomy, Seoul National University

Two methods are developed for deriving from the observations of zodiacal emission the heliocentric distance r dependence of the volumetric absorption cross-section, $n(r)\sigma_{abs}(r;\lambda)$, of zodiacal dust particles. One of the methods is employed to analyze the observed elongation dependence of the zodiacal emission at 11 μm and 21 μm. The resulting r-dependence of $n(r)\sigma_{abs}(r;\lambda)$ depends on wavelength λ, and its difference between the two wavelengths increases with r. It is also found that the r-dependence of $n(r)\sigma_{abs}(r;\lambda)$ in the infrared region cannot be described by a single power-law relation which is frequently used to describe the r-dependence of volumetric scattering cross-section $n(r)\sigma_{sca}(r)$ in the visible region. Implications of the discrepancy between the IR emission and visible scattering will be presented for the heliocentric dust density distribution and for the variation of dust optical properties in the inner solar system.

A Method for Deriving the Heliocentric Dependence of Volumetric Absorption Cross-Section from the IR Zodiacal Emission

Kwon, Suk Minn and Hong, Seoug Soo
Department of Astronomy, Seoul National University

The zodiacal infrared brightness integral is numerically carried out by substituting the following parametric representation for the volumetric absorption cross-section $\zeta(r)$:

$$\zeta(r)=\alpha r^{p_1}+(1-\alpha)r^{p_2},$$

which is a combination of two power-law relations containing 3 parameters. Employing the non-linear