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<研 究 論 文>

Absolute Spectrophotometry of Galactic Wolf-Rayet Stars: Effective Temperatures and Bolometric Corrections.

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The recent data of absolute measurements of flux emitted in the visible continua of some galactic Wolf-Rayet stars are presented, observed by a two-channel built up cooperatively by the Observatoire of Lyon and the Laboratoire d Astronomie spatiale (L.A.S.) in France.

Correction of interstellar reddening is made in detail, prior to the determinations of color excesses, $E(B-V)$. Our dereddened fluxes combined with IUE and ANS ultraviolet measurements are afterwards compared to those of LTE plane-parallel model atmospheres of Kurucz (1979) and integrated, in order to derive effective temperatures and bolometric corrections for the program stars. The derived effective temperatures and bolometric corrections for the stars range respectively from 25000 K to 32700 K, and from B.C.=-2.5mag to B.C.=-3.1mag.

Chromospheric Activity and Rotation of Nearby Solar-Type Stars

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True rotational velocities of nearby solar-type stars are derived by calculated radii, $R(R_\odot)$, and rotation period, P_{cal}(days), using the relation between P_{obs} and chromospheric activity, *i.e.*, R' (HK) (Noyes et al. 1984) and R(K) (Duncan 1981). The inclination of rotation axis to line-of-sight is, then

$$i=\arcsin\frac{P_{cal}v\sin i}{50.61\ R},$$

where $v \sin i$ (Km/sec) is given by Soderblom (1983). It is found that the mean value of (sin i)

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

Umbral Chromospheric Cavity Oscillations for Slow Mode Magneto-Acoustic Waves

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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

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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

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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