solve the momentum problem in the bipolar molecular outflows because the enhanced cavity pressure can drive a momentum flux much in excess of the radiative momentum flux. In fact the momentum flux produced by this mechanism is found to be about 100 times larger than the radiative flux, L_*/c from the central source for an example where $L_*\sim 25L_\odot$, $M_*\sim 2M_\odot$, $N_s\sim 10^8\mathrm{cm}^{-3}$, and $N_d\sim 10^9\mathrm{cm}^{-3}$, which is reasonably consistent with the observation in Bally and Lada's survey (1983).

Integral Method for Deriving the Scattering Phase Function for Zodiacal Dust Particles

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A linear combination of three Henyey-Greenstein phase functions is substituted for the mean volume scattering phase function in the zodiacal light brightness integral. Results of integration are then compared with the observed brightness of zodiacal light in the ecliptic to form residuals. Minimizing these residuals, we determine the Henyey-Greenstein functions which best describe the phase function of interplanetary particles. The resulting scattering function has a moderate peak in the forward direction, an isotropic component, and a mild backscattering enhancement. The same method of non-linear least squares is employed to analyze the polarized component of the zodiacal light, and the resulting polarization characteristics of zodiacal dust are discussed. Since this method is based on a direct comparison of integrated quantities, it is less sensitive to observational error than are direct inversion techniques which rely on differentiations of the observed brightness distribution.

A Systematic Investigation of New Multicolor-Photometric System

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We defined a parameter DV (Differential Volume in color space $\{\vec{C}\}$, $DV\equiv\frac{\partial\vec{C}}{\partial T_{eff}}\cdot\left(\frac{\partial\vec{C}}{\partial\log g}\times\frac{\partial\vec{C}}{\partial[\mathrm{m/H}]}\right)$), which is a measure of resolving power of 3-color photometric system for physical parameters of star. From Kurucz(1978)'s model atmospheres of F, G type stars, DV's were calculated for various sets of mean wavelengths of photometric systems and of hypothetical photometric system which has total responses of exponential form and halfwidth of 200Å. It is concluded that the DDO system including 35, 38 filters is a better choice for F, G type stars than the uvby system and that the UV spectra outside the atmospheric cut-off should be measured in order to derive the mostly separated physical parameters of the stars.

Energy Distributions, Effective Temperature and Luminosities of O Emission, Be and Ae Stars

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We present recent energy distributions of absolute measurements of flux emitted over the wavelength

range of 3,200Å to 8,100Å for three O emission, nine Be, and two Ae stars observed by two-channel scanner at the observatoire de Lyon and Laboratoire d'Astronomie Spatial.

Balmer discontinuities are estimated by means of BCD(1939, Barbier and Chalonge) from the measured energy distributions by comparing them with those of the normal stars. Among Be many have small Balmer discontinuity than that exhibited by the main sequence stars of similar spectral type.

Our de-reddened fluxes together with the ultraviolet measurements of Thomson et al. (1978) are compared to those of Kurucz's model atmospheres(1979) to derive effective temperatures of these stars. With the measured monochromatic fluxes we determined their angular diameters and luminosities. It is found that the majority of these stars are cooler than the zero age main sequence (ZAMS) in the H-R diagram, suggesting that they are slightly more evolved than the ZAMS stars.

Mass-Luminosity Relation for Main-Sequence Stars

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The mass-luminosity relation for main-sequence stars is derived from the 58 visual binary systems, which is found to be $(L/L_{\odot}) \propto (M/M_{\odot})^{3.6}$. In this study, the change of exponent suggested by Strand and Worley(1963) near $M_{bol}=7.5$mag. is not found. Some explanations for the difference between our result and others will be discussed.

Long-Term Luminosity Variation and Dynamo Cycle in Late Type Dwarfs

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Making use of our revised Öpik's convection theory, we have calculated magnetic cycle periods of late type stars by using Parker's dynamo theory to analyze observed magnetic activities of later type stars and long-term luminosity variations observed in spot stars.

From the present investigation it is found that (1) the stellar magnetic cycle period increases towards the later spectral type, (2) the rapid rotation facilitates the activity-related luminosity variation for stars later than about K5 and (3) differential rotation plays a critical role in determining the magnetic activity-cycle period. Finally, it is suggested that the non-local effects should be taken into account in order to understand the observed long-term luminosity variations.

Period Change of BW Vul

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Photoelectric observations of β Cephei star, BW Vul were carried out with UBV and Strömgren *b*