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<研 究 論 文>

Variation of Grain-Size Inside Bok Globule B 361

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Utilizing the PDS microdensitometry system at the Kitt Peak National Observatory, we have performed an automated star counting over Bok globule B 361. Stars as faint as 21 mag. and 22 mag. were counted on the POSS blue and red glass plates, respectively. Resulting extinction map of B 361 has an angular resolution of one arc minute. Distribution of extinction over the projected angular distance from the cloud center can well be approximated by power-laws of two distinctly different indices for the blue and red. The difference in the power-law index strongly suggests that mean grain-size increases towards the cloud center. Effects of grain-size variation upon the mass distribution inferred from extinction measurements will be discussed.

A Role of Gravitational Ram Pressure in Bipolar Molecular Outflows

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We propose that freely falling material can 'squeeze' a jet cavity in the center of an accretion disk, converting it into a momentum reservoir. A central stellar wind escapes through the thin part of the disk, thus developing a stellar jet by the usual nozzle mechanism. We argue that this can

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