

From the variation of line profiles and the missing maxima for the Mira variables, we presented the possibility of the correlation between the maser emission and the effects of the shock from the central star.

Spectroscopic Study of the Long Period Eclipsing Binary Epsilon Aurigae

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From the study of a spectroscopic plate of ϵ Aurigae, we can measure the radial velocity and the relative abundance for this eclipsing binary. Calculated radial velocity is -37 ± 4 km/s and the abundance of [Fe] is estimated as -1.5 .

On the Gegenschein and Symmetry Plane

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Extensive model calculations are made for the distribution of zodiacal light brightness over an extended area near anti-solar point. We let a linear sum of three Henyey-Greenstein functions describe the scattering phase function of zodiacal dust particles. For the distribution of particles in the symmetry plane, we adopted the usual power-law relation of the heliocentric distance measured along the plane; while for the distribution perpendicular to the plane, we employed the fan, modified-fan and ellipsoid models. By systematically changing inclination and ascending node of the symmetry plane, we carefully examined how the varying geometrical aspects of the plane with respect to the sun and observer would modify the morphology of the Gegenschein brightness distribution. Comparison of the calculated brightness distribution with our newly reduced Gegenschein observations will locate the symmetry plane in terms of the inclination and ascending node, and also differentiate the three competing models of density distribution.

Fine Resolution Brightness Distribution of the Visible Zodiacal Light

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In order to obtain an accurate brightness distribution of the visible zodiacal light, we developed a new method for making a time-dependent correction of the atmospheric diffuse light. Applying this method to a set of observations, we were able to reduce the uncertainties involved in reduction

procedures of the zodiacal light considerably. Two dimensional distribution of the zodiacal light brightness is presented on the $(\lambda - \lambda_{\odot}, \beta)$ plane at two visible wavelengths 5080Å and 5300Å with spatial resolution of 2°. It is found that the zodiacal light brightness becomes minimum at elongation around 140°, which is smaller by 10° than that of previous results (Levasseur-Regourd and Dumont, 1980). Our results also show that the brightness at intermediate elongations varies less steeply than that of Weinberg (1963). Features in the resulting brightness distribution will be discussed.

비 균일 중력장에서 파커 불안정성의 선형 해석

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은하 평면과 수직인 방향의 중력가속도가 은하평면으로부터 거리의 선형 함수로 주어진다 가정 (선형 중력가속도)하에, 자화된 기체와 우주선 입자로 이루어진 계의 파커 불안정성에 대한 분산관계를 구하였다.

관측된 성간매질의 물리량들—성간운의 밀도 분포의 높이척도(160pc)와 속도분산(7km/s), 기체압력에 대한 자기압력의 비($\alpha=0.25$), 기체압력에 대한 우주선 입자의 압력의 비($\beta=0.4$)—에 대하여 가장 불안정한 유한 섭동모드의 최소 성장시간척도는 $\sim 10^6$ 년이고 이때의 길이척도는 ~ 100 pc이다. 이 두 척도는 균일한 중력가속도(등 중력가속도)의 경우 보다 10배 정도 작은 값들이다. 또한 최소 성장시간척도는 성간운들의 충돌시간척도인 $\sim 10^7$ 년 보다 작은 값이다. 이 결과로부터 우리는 등 중력가속도에서의 파커 불안정성과는 달리, 선형 중력가속도에서의 파커 불안정성이 α 와 β 의 값이 비교적 작은 성간매질에서도 10^7 년 이전에 성장할 수 있다는 결론을 내릴 수 있다.

Millimeter Wave Observations of the H II Complex G 34.3+0.2(II)

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The molecular cloud associated with the compact H II region G 34.3+0.2 has been observed in the $J=2 \rightarrow 1$ transition of CS and $C^{34}S$ with an angular resolution of 48 arcseconds. The CS integrated intensity distribution which is more concentrated on center shows a similiar tendency to that of CO.

The dynamical features related to molecular outflow and density structure is investigated.

Synthesis of CO Lines for Rotating Molecular Clouds

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Aiming at an empirical basis for probing internal dynamics of dark interstellar clouds, we investigate to what extent the observed line profiles and shifts may accommodate the rotational