

of time. We emphasize the importance of the very brief core-collapse phase to the number of tidal capture events.

Two-Temperature Accretion Disk Revisited

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Two-temperature accretion disk models of 70's (Shapiro, Lightman, and Eardley 1976) are reconstructed. The coupling between ions and electrons is generalized for relativistic temperatures. The cooling mechanism is specified: the central or local disk source provide copious soft photons. The radiative transfer treatment in the vertical direction is improved. The assumption that the Compton parameter is equal to 1 is reexamined.

The results under these assumptions are compared with those of SLE's classic model. We found two branches of solutions: One has electron and ion temperatures equal to the soft-photon temperature which is quite low. The other has ion temperature in the region 10~1000 times the rest mass of the electron while electron temperature 1/10~1/100 times the rest mass of the electron. The implication of the models are studied in the context of accretion by black holes and neutron stars.

별의 분광형과 Johnson UBV 계의 온도효과

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Hamamatsu의 1 P21의 온도효과 자료를 이용하여 공주대학교 측광계의 온도에 따른 특성을 이론적으로 계산하였다. 온도효과를 가장 민감하게 받는 영역은 V band 영역으로 그 크기는 약 $5.2 \text{ \AA}/\text{C}$ 이었으며, B band 영역은 약 $0.4/\text{ \AA} \text{ C}$ 으로 작은 값을 보였다. 그리고 그러한 효과를 실제 관측자료에서 검증하기 위해 변광성 AR Lac 을 1990년 9월에서 1991년 1월까지 관측하여 온도효과를 도출하여 본 결과, 거의 유사한 값을 보여 주었다.

한편 AR Lac의 광도곡선을 분석하는 과정에서 부극소의 깊이가 기존의 결과에 비해서 약 0.2등급 정도 현저하게 깊게 나타나 변광성 자체에 큰 변화가 있음을 암시해 주었다.

CO Observations of Barnard 361

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An area covered on a prototype globule Barnard 361 was observed in the CO ($J=1-0$) transition.

Employing the usual LTE analysis, we determined the CO column densities over the area extending $20' \times 20'$. The column density at the globule center is found to be 10^{17}cm^{-2} . At a distance of 600pc, the globule contains mass amounting $200M_{\odot}$. For the isotopic species, we made the position-velocity map in several directions across the cloud, and also made the velocity centroid map. The map shows that the cloud consists of rigidly rotating core and constantly rotating envelope. The velocity centroid map of ^{12}CO as well as ^{13}CO traces the velocity field fairly well.

CO Observations of a Region in the Perseus arm Containing Hb 12 and its Immediate Vicinity

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High resolution ^{12}CO observations of the region containing the planetary nebula Hb12 were made with the Nobeyama Radio Telescope. These observations reveal that there is no significant CO emission from Hb12 itself. Near Hb12, however, the observed regions show a structure of clustered dark clouds whose physical parameters suggest that these clumps would be further fragmented or collapsed. Also found with the high resolution observations is that a few isolated clumps are located away from the main CO feature extended possibly from the galactic plane. For more detail morphologies and velocity structures of the clumps, especially in relation to the large CO complex to which these are likely to be associated, more observations are substantiated.

IRAS Observations of Dark Globules

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Infrared emission maps are constructed at 12.5, 25, 60 and $100\mu\text{m}$ for dark globules B5, B34, B133, B134, B361, L134 and L1523 using Infrared Astronomical Satellite data base. These clouds are selected on the basis of their appearance in Palomar print as dark obscuring objects with angular sizes in the range of 3 to 30 arcminutes. The short wavelengths (12.5 and $25\mu\text{m}$) maps show the embedded infrared sources. These are identified as late type stars, circumstellar envelopes or reddened stars. We found many such sources only in B5, B361 and B34 regions. Diffuse component at $25\mu\text{m}$, arising from the stochastically heated small dust grains ($a \lesssim 0.01\mu\text{m}$) by interstellar radiation field, is found in B361 and L1523 regions. Such emission is characterized by the limb brightening, which is confirmed L1523 and marginally detected in B361.