depending on the geometry of the scattering medium rather than on the initial photon spectrum.

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Local and Global Oscillations in Radiation-Dominated Accretion Flows

Myeong-Gu Park

Department of Astronomy and Meteorology, Kyungpook National University

Many high luminosity low mass X-ray binaries exhibit Quasi-Periodic Oscillatory luminosity change. Three different behaviors of QPO found so far are classified as Horizontal Branch (HB), Normal Branch (NB), and Flairing Branch (FB). Beat frequency model is generally believe to provide the decent explanations for HB. However, there is no single universally accepted model for NB and FB. Only Lamb, Miller, and Fortner's radiation hydrodynamic model based on the numerical simulation has shown some hopes toward understanding these objects.

In this work, we lineraized the time-dependent radiation hydrodynamic equations and sought for the instabilities of the flow by using symbolic manipulation programs and numerical multiple shooting technique. Even after including general relativistic effects, the flow is stable to spherically symmetric perturbation, mainly due to the advection. But we found non-radial global modes have more interesting properties. The feedback between the production of radiation and the flow of gas controlled by the outcoming radiation generates mostly damped global modes, each of which is associated with a characteristic oscillation about the steady configuration. Under the conditions typical of low-mass X-ray binaries, some weakly damped modes exist and would be observable. These modes, especially when the luminosity of the system is close to the Eddington critical value, show some desirable properties QPO in these objects.

CCD Photometry of an Open Cluster NGC 7039

Jeong Man Kim

Department of Earth Sciences, Pusan University

Chul Hee Kim

Department of Earth Sciences, Chunbook University

A BVRI CCD-Photometry of the open cluster NGO7039 using data taken by 72 inch telescope at Dominian Astrophysical Observatory is presented. As the limiting magnitude of the CCD data is lower than that of photographic or photoelectric data, we were able to drive more accurate estimates of the distance modulus and age of the cluster. Our best estimate is $(m-M)_0$ = 10.3 (i.e. 1150 pc) which is larger than Schoneigh's estimate of 700pc. When

we fitted the main-sequence to the standard sequence of Pleiades, the age of the cluster was estimated to be about 2×10^9 yrs, assuming the metal abundance of 0.01. This contradicts to earlier estimate by Zelwanowa & Schoneich (1971) of 10^9 yrs, but is consistent with Hassan's (1972) result.

PROGRESSIVE REPORT ON A CCD PHOTOMETRY OF OPEN CLUSTERS

Hong Bae Ann, Sun Shick Kim, Yu Don Kang, and Yong Woo Kang
Department of Earth Sciences, Pusan National University

We have conducted CCD photometry of open clusters on BVRI system using cooled CCD attached to the 61cm reflector of Sobacksan Observatory. We intended our photometry as deep as possibile in order to test the feasibility of the observations of cluster luminosity functions. The faintest stars from single exposure of 300 s is fainter than V = 19 for the seeing conditions with FWHM of 3.5". The C-M diagram of the central region of an old open cluster NGC2420 whose distance modules (m-M) = 11.95, shows well defined giant branch and main sequence which can be identified down to almost 5 mag below the turnoff. The red hook in the turnoff region which is best explained by the models with overshoot mixing (Twarog et al. 1990) is well observed in the C-M diagram. The present photometry of NGC2420 shows the possibility of cluster observations in the Sobacksan observatory.

Globular Clusters in Dwarf Galaxies and the Formation of Non-nucleated Dwarf Galaxies

K.S. Oh[1] and D.N.C. Lin[2]
[1] Department of Astronomy and Space Science, Chungnam National University
[2] Board of Studies in Astronomy and Astrophysics, University of California, Santa Cruz

We try to examine dynamical processes which could lead formation of non-nucleated dwarfs. We focus on the fact that some dwarf spheroidals have globular clusters. The dynamical friction will be important and effective for globular clusters' orbital decay in dwarf spheroidal galaxy. As the clusters sink to the center of a host galaxy, they eventually interact with each other. Repeated encounters provide opportunities for the clusters to eventually coagulate. So the dynamical friction causes the formation of nucleated dwarf galaxies. But this mechanism can not explain the formation of non-nucleated dwarf galaxies. Here we propose the tidal effect due to parent galaxy to resolve this problem. In order to study this dynamical process, we adopt a restricted N-body numerical scheme based on Aarseth's NBODY1 scheme. We adopt a logarithmic potential for the parent galaxy and the eccentric orbit for the dwarf galaxy. Our results
suggest that the tidal effect can prevent the globular clusters from concentrating near central region