장은 자기부력에 의해 태양표면으로 상승하면서 흑점, 플레어 및 홍염 등의 다양한 활동현상을 일으킨다. 본 연구에서는 이와 같이 표면활동 현상의 근원이 되는 태양활동영역의 진화과정을 단계적으로 살펴보고 초기단계에 관측되는 자력관의 상승현상이 태양대기층에 미치는 영향을 MHD 수치계산을 통하여 연구하였다. MHD 계산에는 질량, 운동량 및 에너지 보존식과 인덕션 식을 이용하였다.

Concentric Aperture Photomeric Observations using the Narrow Band Filters of the Spherical Objects

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Using the medium and narrow Strömgren-Crowford filters, we observed elliptical galaxies and globular clusters with the concentric aperture method. Among them elliptical galaxies M87 and M105 and the globular cluster M3 show the marginal increase of the colour index b-y, which means the central region is redder than the outer part. The metal index m_1 is more in M87 and M105 in the central region, which observing result may support the existence of super massive or heavy objects in the central region of these galaxies. However we could not find any variation in the late type elliptical galaxy NGC205 and a globular cluster M3. The metal poor and X-ray globular cluster M15 shows the redder b-y and similar m_1 values in the central region.

Fragmentation of Large Scale Structure and the Spectrum of Cosmological Perturbations

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We examine the spectrum of cosmological perturbations which may give origin to a cellular observer-homogeneous self-similar structure in the Universe. We assume that this structure originates by successive fragmentations in the dark matter "ino" component, due to a process of Jeans instability. The fragmentation is characterized by the number of fragments(N) occurring at each step and by a characteristic "lagging time factor(τ)" at each successive fragmentation. In order to fulfil the observed spectrum of perturbations, at the present epoch, suitable values of τ are defined, the process is quite independent on the value of N. The initial spectrum of density perturbations is found to have a flat spectrum in mass with an upper and lower cutoff. The initial amplitudes of the perturbations, as well as the ones to be found at the era of decoupling between matter and radiation, are discussed.

Radial Color Variation of 3 LMC Globular Clusters

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Integrated radial color variations of 3 globular clusters(H4, ES0121-SC03, and LW79) in the

LMC are obtained from the collected CCD photometry data(Mateo and Hodge 1986, 1987, Mateo *et al.* 1986). The ages of these clusters are given by $2.5\pm0.4\times10^9$, $10\pm2\times10^9$, and $1.8\pm0.3\times10^9$ years, respectively. These are slightly smaller than the mean age of globular clusters in the Galaxy.

Our analysis of these data allow us to reach the following conclusions: (1) For two of them (H4, ES0121-SC03), it is found that the mean color of the central region is redder than that of the outer region. (2) Although all of them have the similar dynamical condition, only two of them(H4, LW79) show the mass segregation of red giant stars. But this dose not correlate with the radial color variation. (3) Two clusters which show the radial color variations are older than the other, and have relatively lower metal abundances.

So, the evolution of LMC globular clusters may depend more on conditions at the time of their formation than the dynamical process.

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Luminosity Distribution NGC 3379

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We investigated the detailed luminosity structure of an elliptical galaxy NGC3379, by making use of Kiso V-band plates and PDS. A weak deviation from the $r^{1/4}$ law in the luminosity profile along the major axis of NGC3379 is confirmed. The luminosity profiles along the North-South direction and South east-North west direction also show similar deviation.