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Observations of the early photons from evolution of optical afterglows or internal shock provides the crucial clues on the nature of the bursts and environments. Hundreds of GRBs afterglow observations in multi-wavelength region have been made mainly thanks to the fast ( $\sim 60$  seconds after the trigger) localisation GRB by Swift and its fast alert to the ground telescope. It helps to improve our understandings tremendously, however many enigmas still remain, such as burst mechanism, transition prompt emission to the afterglow, early optical flash, rise phase of the early optical light curve and some missing afterglows. They could be addressed by fast slewing and multi colour and IR follow-up by future telescopes.

The primary aim of UFFO/Lomonosov is to follow up optical fast ever, within a couple of seconds after trigger by onboard X-ray telescope. Its optical FOV is  $30 \times 30$  degrees. As a key instrument, the Slewing Mirror to redirect the optical beam from GRBs rapidly to the Ritchey-Chretien telescope. The status and launch schedule of the UFFO/Lomonosov and its test performance will be reported and prospects for the next missions will be discussed.

### [포 GC-03] Monitoring of Gamma-ray Bright AGN : The Multi-Frequency Polarization of the Flaring Blazar 3C 279

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We present results of long-term multi-wavelength polarization observations of the powerful blazar 3C 279 after its  $\gamma$ -ray flare on 2013 December 20. We followed up this flare by means of single-dish polarization observations with two 21-m telescopes of the Korean VLBI Network, carried out weekly from 2013 December 25 to January 11, and at 22, 43, and 86 GHz, simultaneously. These observations were part of the Monitoring Of GAMMA-ray Bright AGNs (MOGABA) program. We Measured 3C 279 total flux densities at 22, 43, and 86 GHz, showing a mild variability of a factor of  $\leq 50\%$  over the period of our observations. The spectral index ranged from  $-0.13$  to  $-0.36$  at between 22 and 86 GHz. The degree of linear polarization was in the range of  $6 \sim 12\%$ , and slightly decreased with time at all frequencies. We found Faraday rotation measures

(RM) of  $-300$  to  $-1200$  rad  $m^{-2}$  between 22 and 43 GHz, and  $-800$  to  $-5100$  rad  $m^{-2}$  between 43 and 86 GHz. The RM values follow a power law  $|RM| \propto \nu^a$ , with a mean  $a$  of 2.2, implying that the polarized emission at these frequencies travels through a Faraday screen in or near the jet. We conclude that the regions emitting polarized radio emission may be different from the region responsible for the 2013 December  $\gamma$ -ray flare, and that these regions are maintained by the dominant magnetic field perpendicular to the direction of the radio jet at milliarcsecond scales.

### [포 GC-04] The Demographics of galactic bulges in the SDSS database

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We present a new database of our two-dimensional bulge-disk decompositions for 14,482 galaxies drawn from SDSS DR12 in order to examine the properties of bulges residing in the local universe ( $0.005 < z < 0.05$ ). We performed decompositions in g and r bands by utilizing the GALFIT software. The bulge colors and bulge-to-total ratios are found to be sensitive to the details in the decomposition technique. The g-r colors of bulges derived are almost constantly red regardless of bulge size except for the bulges in the low bulge-to-total ratio galaxies (approximately  $B/T_r \leq 0.3$ ). Bulges exhibit similar scaling relations to those followed by elliptical galaxies, but the bulges in galaxies with lower bulge-to-total ratios clearly show a gradually larger departure in slope from the elliptical galaxy sequence. The scatters around the scaling relations are also larger for the bulges in galaxies with lower bulge-to-total ratios. Both the departure in slopes and larger scatters are likely originated from the presence of young stars. While bulges seem largely similar in optical properties to elliptical galaxies, they do show clear and systematic departures as a function of bulge-to-total ratio. The stellar properties and perhaps associated formation processes of bulges seem much more diverse than those of elliptical galaxies.