[구GC-16] The environments of GRB 100205A field

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GRB 100205A is a Gamma Ray Burst (GRB) which is suspected to be at $11 \lesssim z \lesssim 13.5$ due to its very red H-K color ($(H-K)_{vega} = 2.1 \pm 0.5$). We observed a field centered at GRB 100205A with the Wide Field Camera (WFCAM) at the United Kingdom Infrared Telescope (UKIRT) in Hawaii, so as to find a $11 < z < 13$ quasar that could be located around the GRB. The images were obtained in J, H, and K filters covering a square area of 0.75 deg^2 to the depths of 22.5, 21.4, and 20.2 in Vega magnitude at 5σ, respectively. Also using a z-band image observed by MegaCam in Canada France Hawaii Telescope (CFHT), we found 12 candidates that have colors consistent with a quasar at $11 < z < 13$ with two criteria; (1) non-detection in z-, J-bands and $(H-K)_{vega} > 1.6$ (2) only detection in K-band with $(H_{limit}-K)_{vega} > 1.6$. However, we also find 627 red ($(H-K)_{vega} > 1.4$) objects that are likely to be old or dusty galaxies at $z \gtrsim 3$, so the 12 candidates could be these red objects. These red objects are found to be strongly clustered in the Ultra Deep Survey (UDS) fields of UKIRT Infrared Deep Sky Survey (UKIDSS) than those in the GRB 100205A field. We suggest a lack of a strongly clustered region surrounding an extremely high-redshift GRB with some limitations.

[구GC-17] Investigating the cosmic evolution of the black hole mass-bulge luminosity scaling relation

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We investigate the cosmic evolution of the black hole mass-bulge luminosity relation with a sample of 52 moderate-luminosity AGNs at $z \simeq 0.36$ and $z \simeq 0.57$, corresponding to look-back times of 4 and 6 Gyrs. By employing robust multi-component spectral and structural decomposition methods to the obtained high-quality Keck spectra and high-resolution HST images, black hole masses (M_{BH}) are estimated from the Hbeta broad emission line with the 5100A nuclear luminosity, and bulge luminosities (L_{bul}) are derived from the surface photometry. Based on these consistent measurements, we constrain the redshift evolution of the $M_{BH}-L_{bul}$ relation by performing the Monte Carlo simulations designed to account for selection effects. We provide implications of our results in terms of the black hole-galaxy co-evolution and discuss possible bulge growth mechanisms.