

X39a No Ly α emitters detected around a QSO at z=6.4: Suppressed by the QSO?

Tomotsugu Goto (NTHU), Yousuke Utsumi (Hiroshima-U), Satoshi Kikuta, Satoshi Miyazaki (GUAS/NAOJ), Kensei Shiki (Hiroshima U), and Tetsuya Hashimoto (NTHU)

Understanding how QSO's UV radiation affects galaxy formation is vital to our understanding of reionization era. Using a custom made narrow-band filter, *NB906*, on Subaru/Suprime-Cam, we investigated the number density of Ly α emitters (LAE) around a QSO at z=6.4. To date, this is the highest redshift narrow-band observation, where LAEs around a luminous QSO are investigated. Due to the large field-of-view of Suprime-Cam, our survey area is ~ 5400 cMpc², much larger than previously studies at z=5.7 (~ 200 cMpc²).

In this field, we previously found a factor of 7 overdensity of Lyman break galaxies (LBGs). Based on this, we expected to detect ~ 100 LAEs down to *NB906*=25 ABmag. However, our 6.4 hour exposure found none. The obtained upper limit on the number density of LAEs is more than an order lower than the blank fields. Furthermore, this lower density of LAEs spans a large scale of 10 pMpc across. A simple argument suggests a strong UV radiation from the QSO can suppress star-formation in halos with $M_{vir} < 10^{10} M_{\odot}$ within a pMpc from the QSO, but the deficit at the edge of the field (5 pMpc) remains to be explained.