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Properties of five z∼0.3–0.4 confirmed LyC leakers: VLT/XShooter observations

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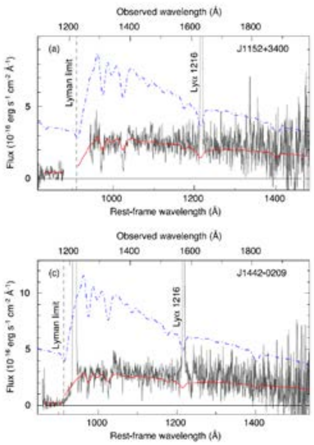
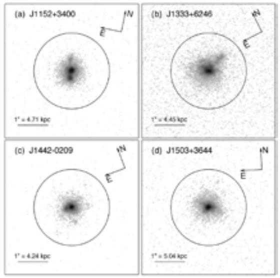
Z=0.3–0.4 LyC Leaker
- HST-COS分光で発見 (Izotov+16a,b)
- 11天体、f_esc=2–76%
- High-zの良いanalog
- M*~1e9Msun

VLT-X-shooter 分光





- 電子密度
  - ~400/cc
  - 近傍よりも大きめ、hi-zの値に近い
- Nitrogen Abundance
  - N/O~-1.16
  - 太陽より低い：Primary N producion起因
  - SDSSなどののlowestは~-1.7
  - なぜそれらより高い？
    - Low-metallicity Gasの流入(どういうこと？)？
    - WRからのoutflow？ ：非常に若い(4-5Myr) starburstとconsistent

Table 3. Ionic and Total Heavy Element Abundances

Property	J0901+2119	J0925+1403	Galaxy J1011+1947	J1154+2443	J1442-0209
T_e(O III) (K)	13658 ± 232	12426 ± 227	15142 ± 285	16441 ± 505	14046 ± 278
T_e(O II) (K)	13144 ± 209	12200 ± 210	14080 ± 247	14720 ± 422	13410 ± 248
T_e(S III) (K)	12652 ± 193	12135 ± 188	13677 ± 237	15498 ± 419	12995 ± 231
T_e(O III)IRAF[a] (K)	13777 ± 320	12513 ± 306	15304 ± 396	16646 ± 663	14173 ± 378
T_e(O II)IRAF[a] (K)	13188 ± 662	13594 ± 681	...	...	11894 ± 622
N_e(S II) (cm^{-3})	364 ± 92	225 ± 76	608 ± 158	180 ± 150	88 ± 66
N_e(S II)IRAF[a] (cm^{-3})	387 ± 50	237 ± 42	652 ± 171	173 ± 209	80 ± 38
N_e(S II)new[b] (cm^{-3})	298 ± 39	194 ± 32	474 ± 114	146 ± 168	81 ± 35
N_e(O II)IRAF[a] (cm^{-3})	410 ± 14	296 ± 13	547 ± 35	**334** ± 30	**341** ± 20
N_e(O II)new[b] (cm^{-3})	481 ± 17	345 ± 15	646 ± 40	**365** ± 33	**388** ± 24

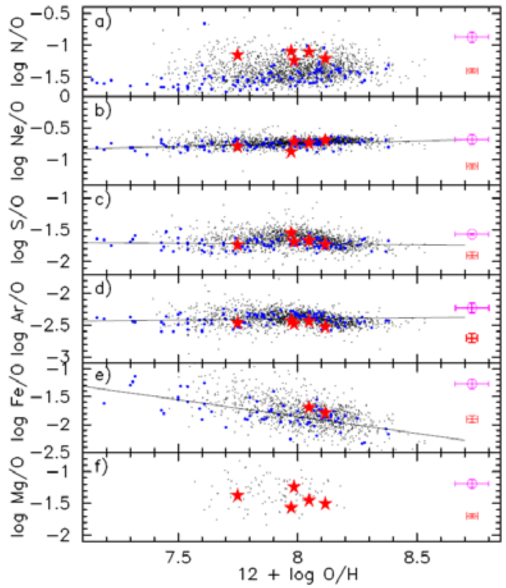


Figure 1. Dependences of different elemental abundance ratios

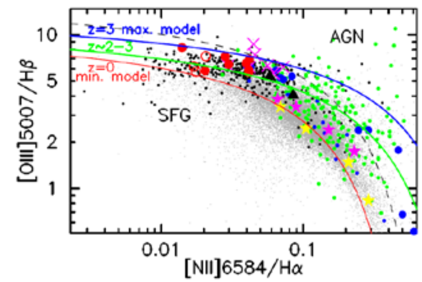


Figure 5. BPT diagnostic diagram

- HeII 4686
  - 強度は0.008-0.02F_Hbeta
  - BPASSモデルでも再現できない
- BPT Diagram
  - Z=2-3的な分布
  - Ionization parameterは大きい
  - ξion=1e25.54
- Hbeta等価幅:180-430A, Hi-zLBGとおなじ
- HeI
  - 3889/6678-7065/6678でN(HI)推定ができる (Izotov+17b)
  - ほぼすべてN(HI)小さい(1e17) =>そのせいでLyCが漏れている？

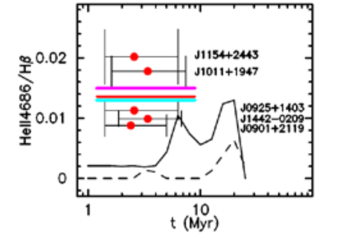


Figure 3. Dependence of the He II 4686Å/Hβ ratios on the

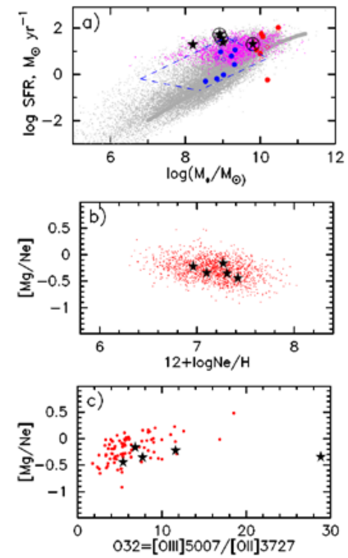


Figure 4. a) Dependence of SFR on stellar mass M*. Five our sample galaxies with Mg II emission are shown by large black

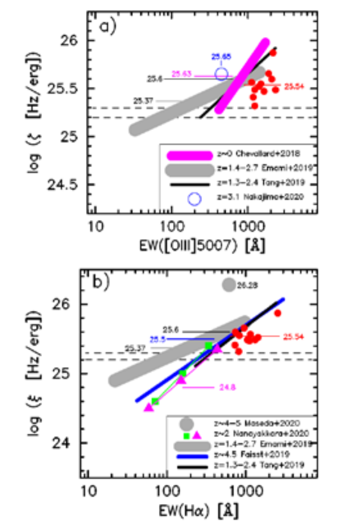


Figure 8. Relation between the ionising photon production efficiency ξ and EW([O III]λ5007) (a) and EW(Hα) (b). Our LyC