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Near-Infrared Spectroscopy of Galaxies During Reionization: Measuring C III] in a Galaxy at z = 7.5

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EoRでの銀河からの電離光子の寄与の評価が重要
でも、このころの銀河の物理的性質はよくわかっていない。暗いしrest-UVしか分光できない => LaAくらい
LyAはIGMの吸収/resonant scatterをうける
⇒ CIII]1907,[CIII]1909に注目
- LyAに次いで強い
- z~2ではlower-Zで等価幅大
- zが正確にわかる

CANDELS z7_GND_42912 (Z=7.5056 LAE)のMOSFIRE H-band分光
- H=25.38AB
- 0.7”slit
- ~10hr total exposure in 2014, 2016 and 2017
- CIII]1907 or 1909が検出
- SiIII]1883,1892は検出されず

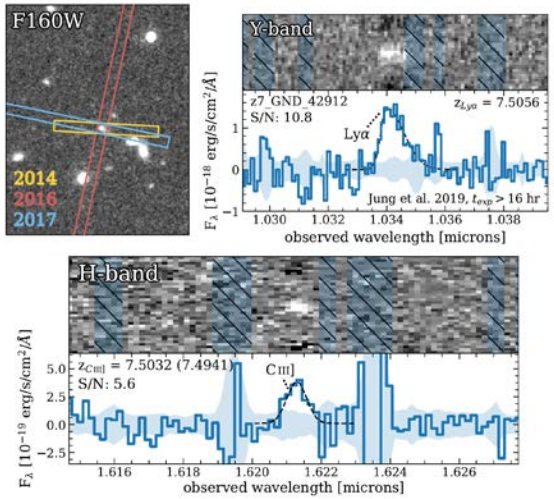

Figure 2. *Top left:* A zoom in of the CANDELS/GOODS-N field in F160W band, centered on z7_GND_42912. The different-colored slits

受かったのはCIII]1907 or 1909?
⇒ Z>6でΔV_LyA>350km/sなのは M_UV>22magのものだけ
⇒ おそらく[CIII]1907だろう (ΔV_LyA=88km/s)

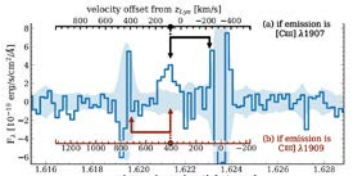

Figure 4. Systemic redshift determination for z7_GND_42912 for the case that the detected emission line is (a) [C III] λ1907 or (b) C III] λ1909

- [CIII]1907=1.5 CIII]1909を仮定
- [CIII]1907+CIII]1909/LyA が大きな値になっている。
- IRAC[3.6]-[4.5]color
  - Strong [OIII]5007
  - 等価幅600A
- CLOUDYシミュレーション
  - BPASS
  - Starburst99
  - AGNモデル

⇒ BPASSでないと再現できない(特にIRACcolor)
⇒ ionization parameter logU>-2

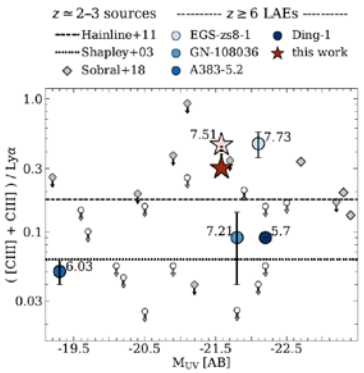

Figure 6. All measured $z \geq 6$ galaxies with spectroscopic measure-

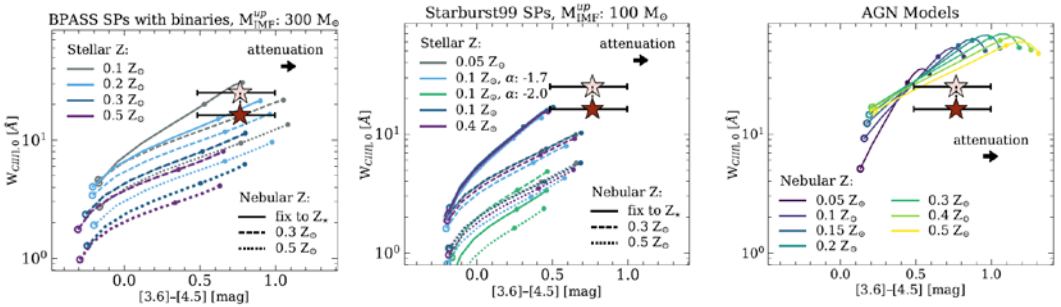

Figure 7. Restframe equivalent with of the C III] doublet versus IRAC color. The large stars represent z7_GND_42912 where the dark red (light

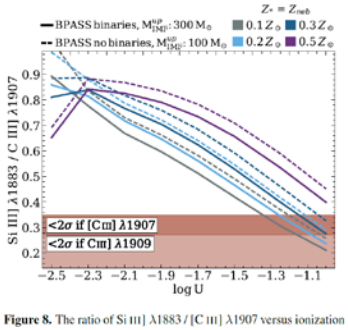

Figure 8. The ratio of Si III] λ1883 / [C III] λ1907 versus ionization

- SiIII]のnon-detection
- Ionization parameterはさらに大きくなる: logU>-1.5