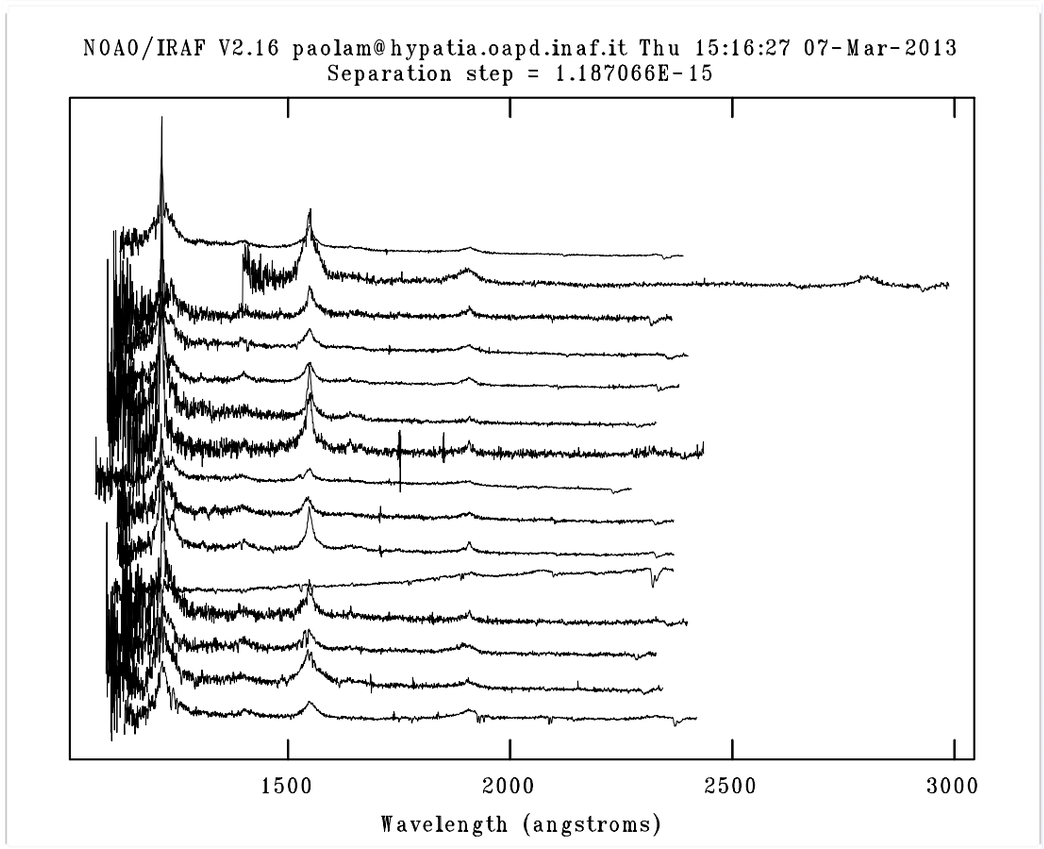
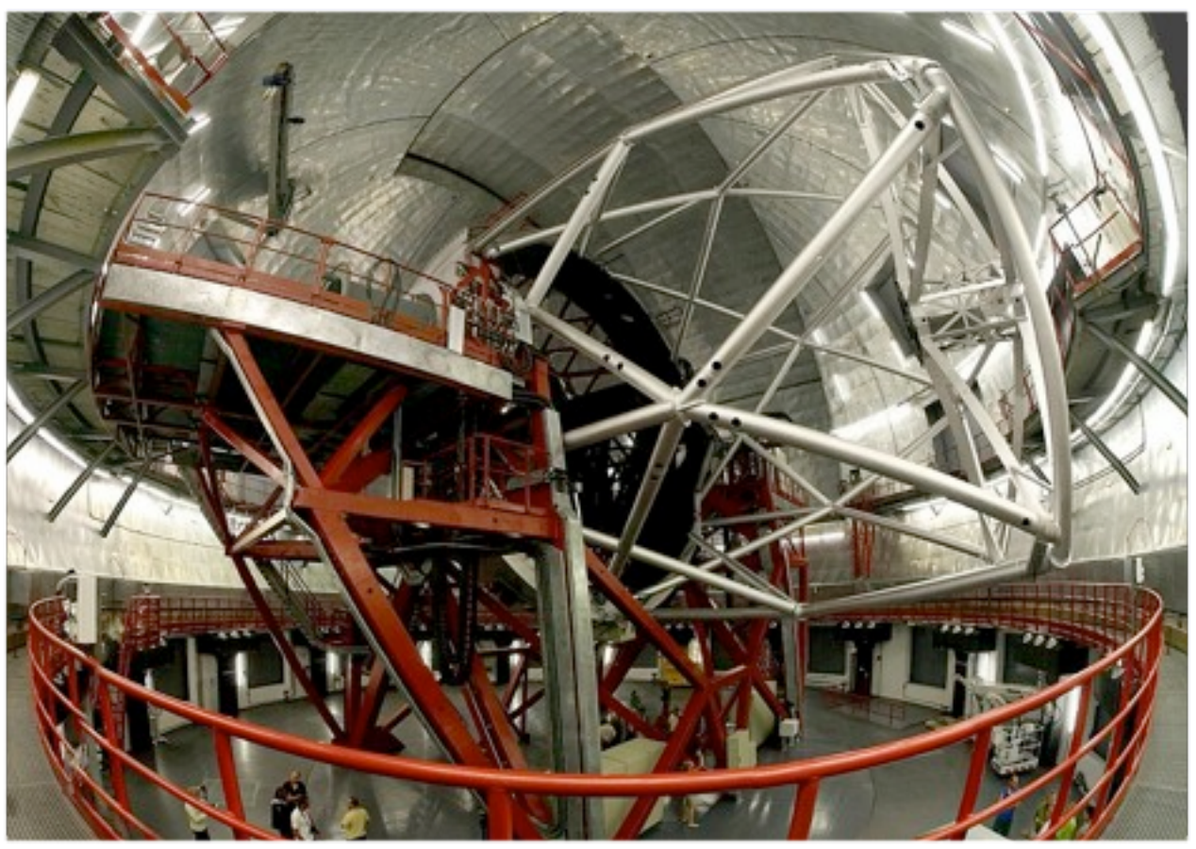
Exploring the faint end of the high-z quasar luminosity function with the GTC

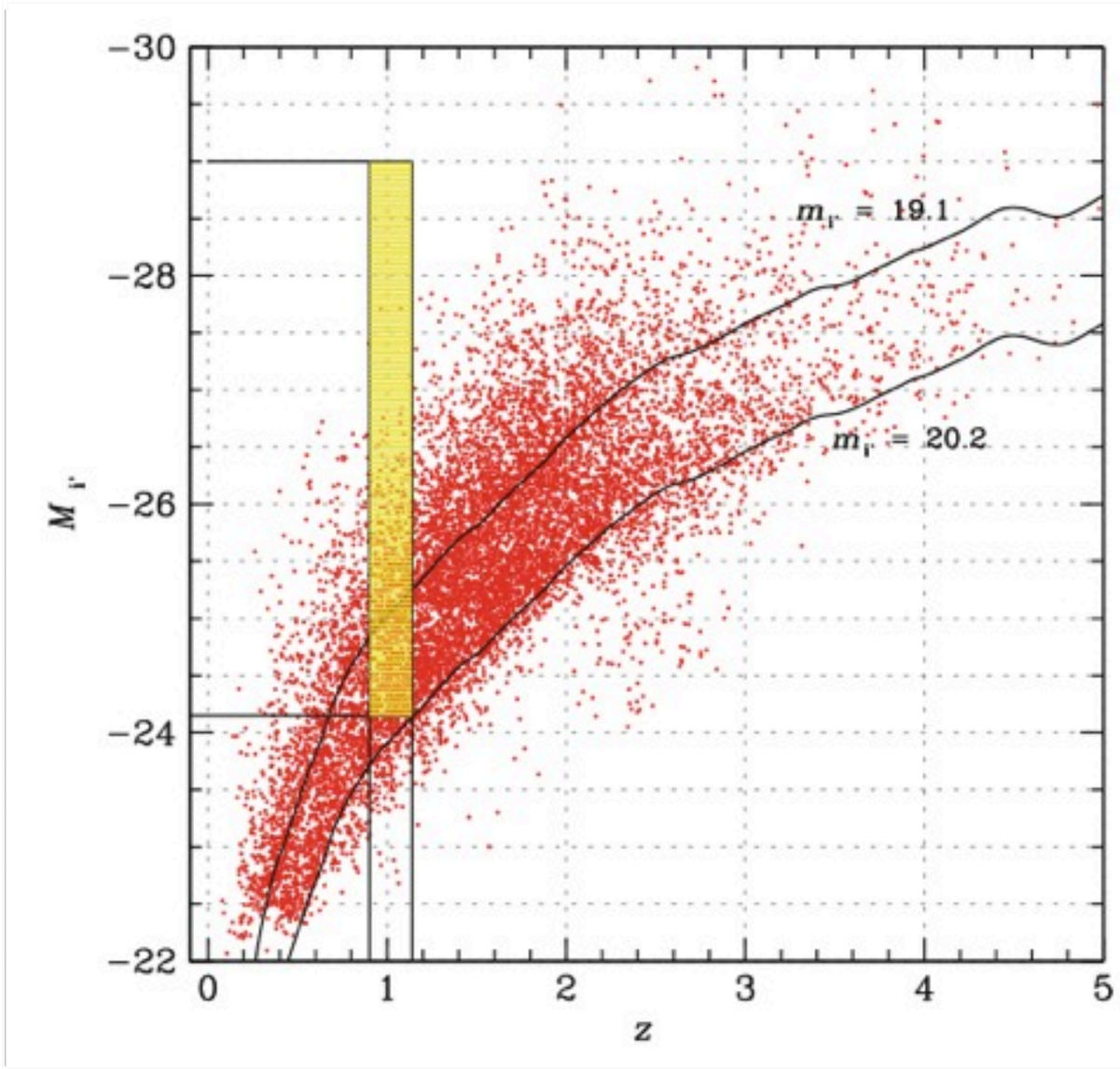


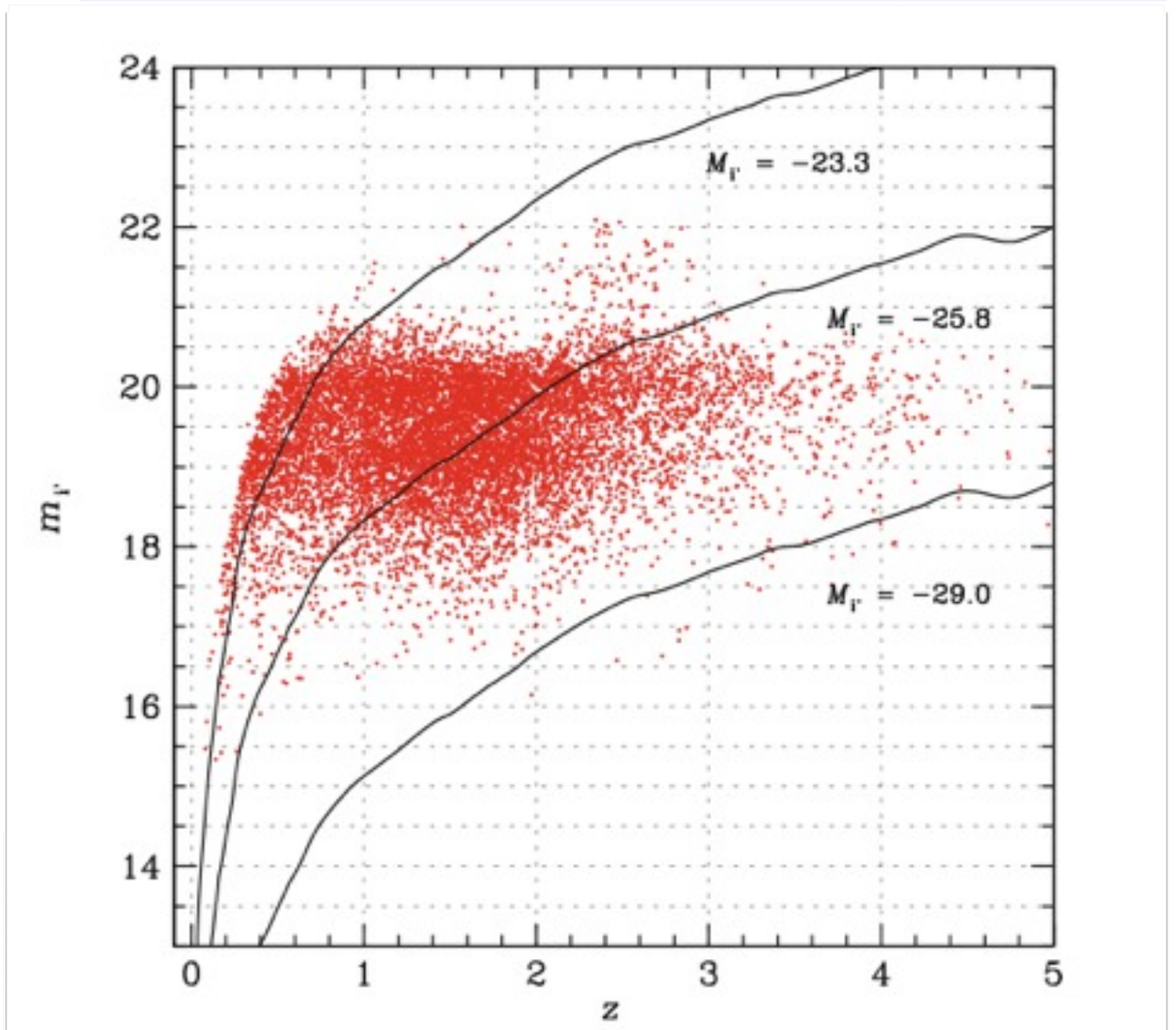


Jack W. Sulentic, Ascensión del Olmo
Instituto de Astrofísica de Andalucía (CSIC), España

Paola Marziani
INAF, Osservatorio Astronomico di Padova, Italia

Do we need more quasars?

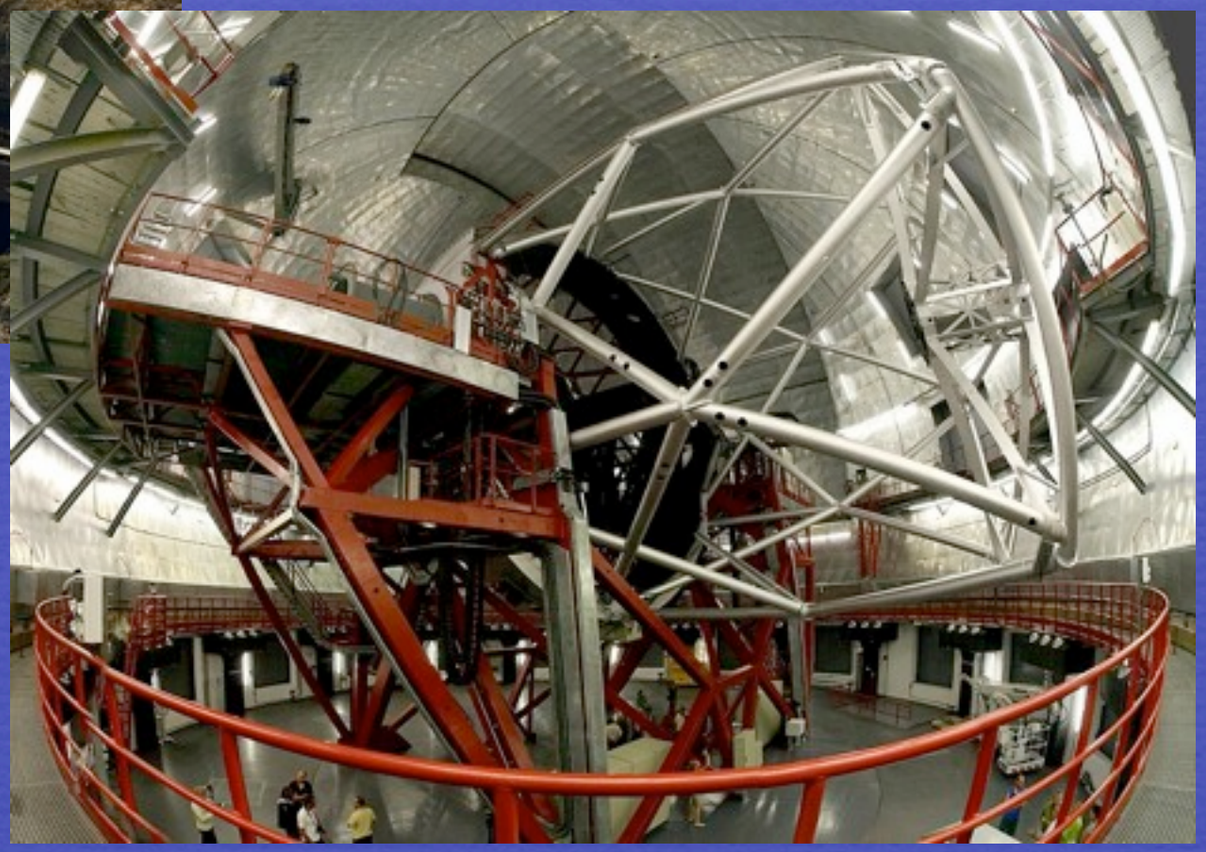




SDSS quasars from the vetted catalogue of Schneider et al.

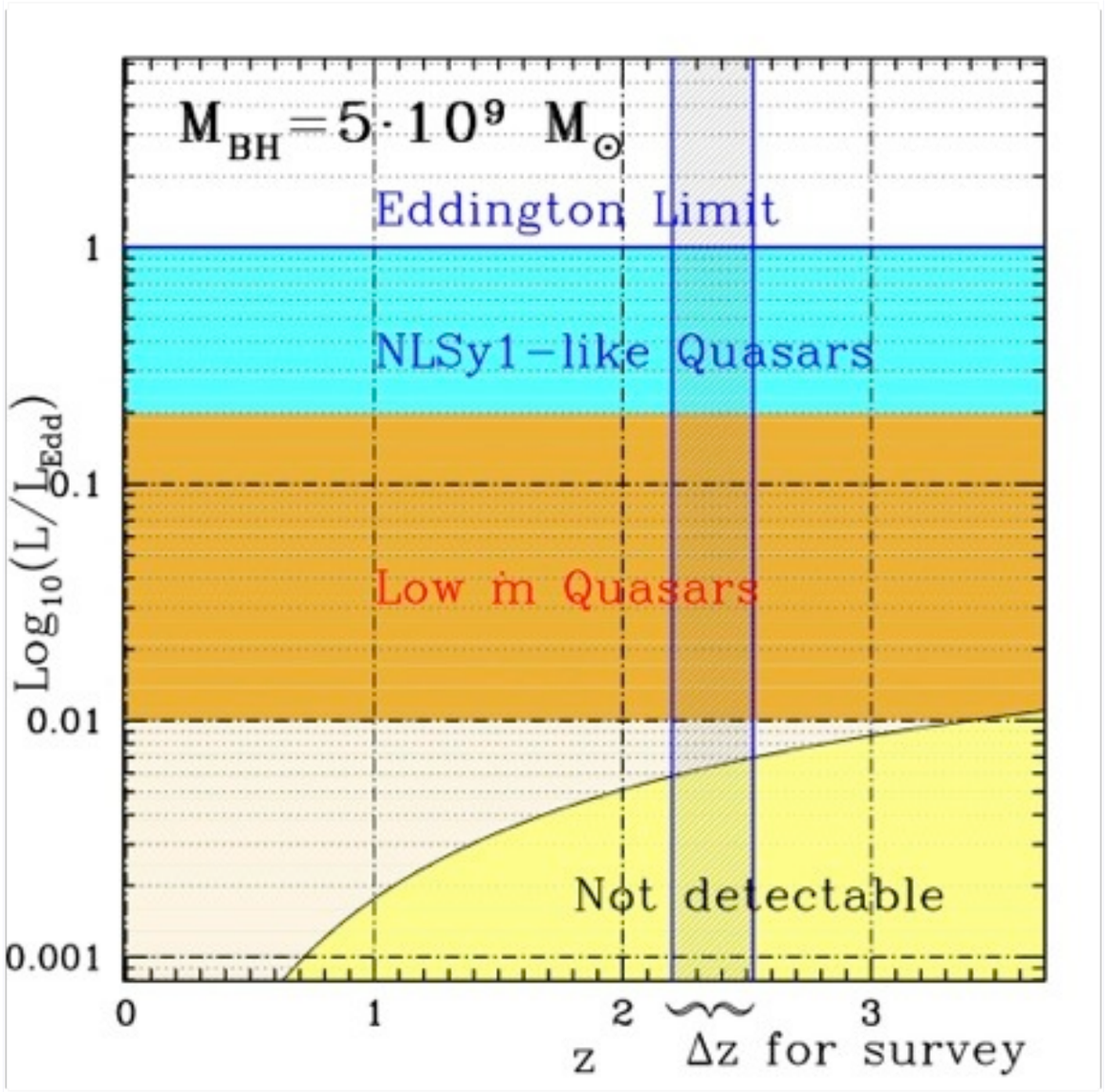
Gran Telescopio Canarias (GranTeCan)

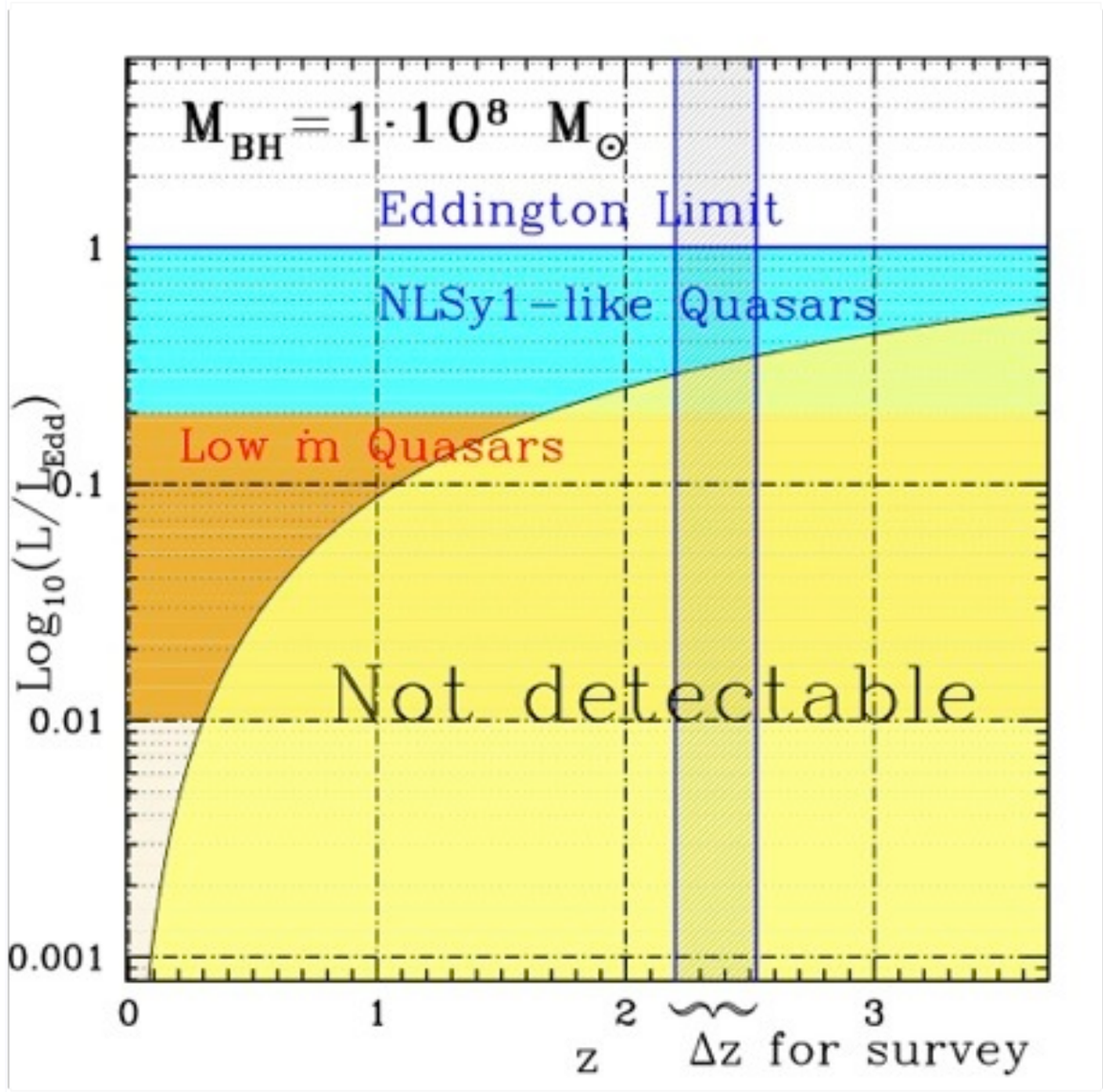
Aperture 10.4m



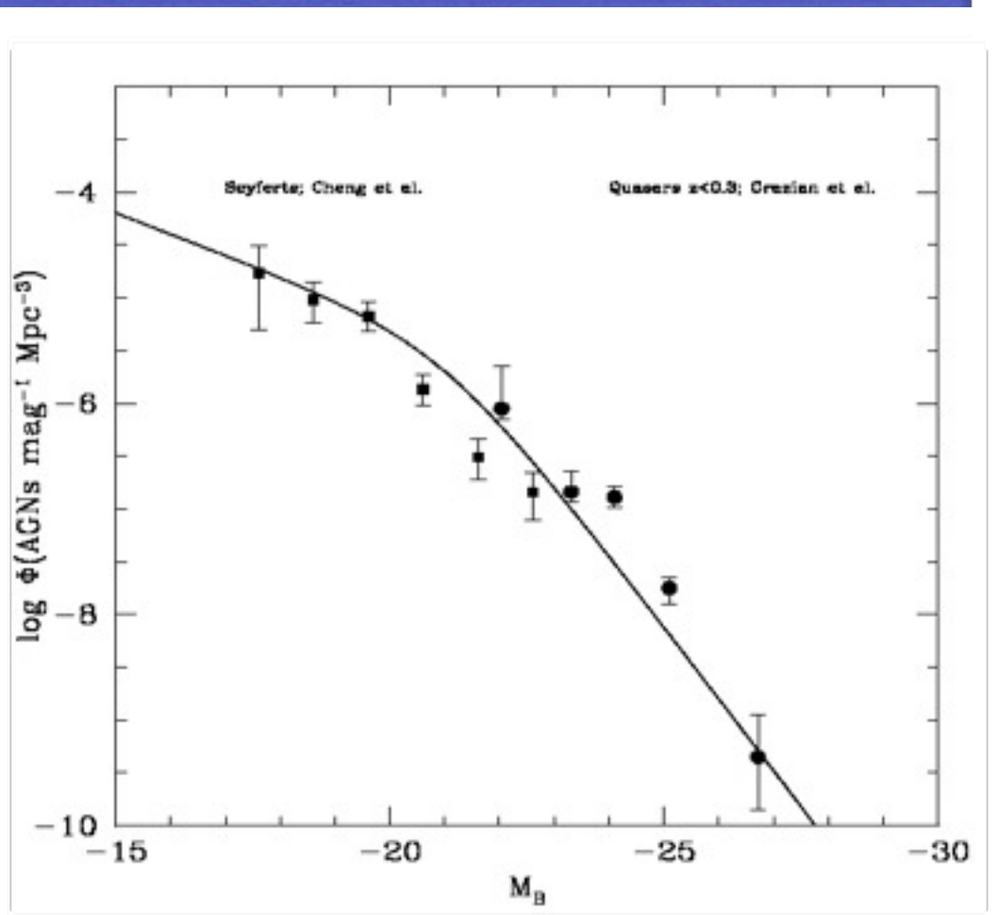
FOSC “OSIRIS” R~1000

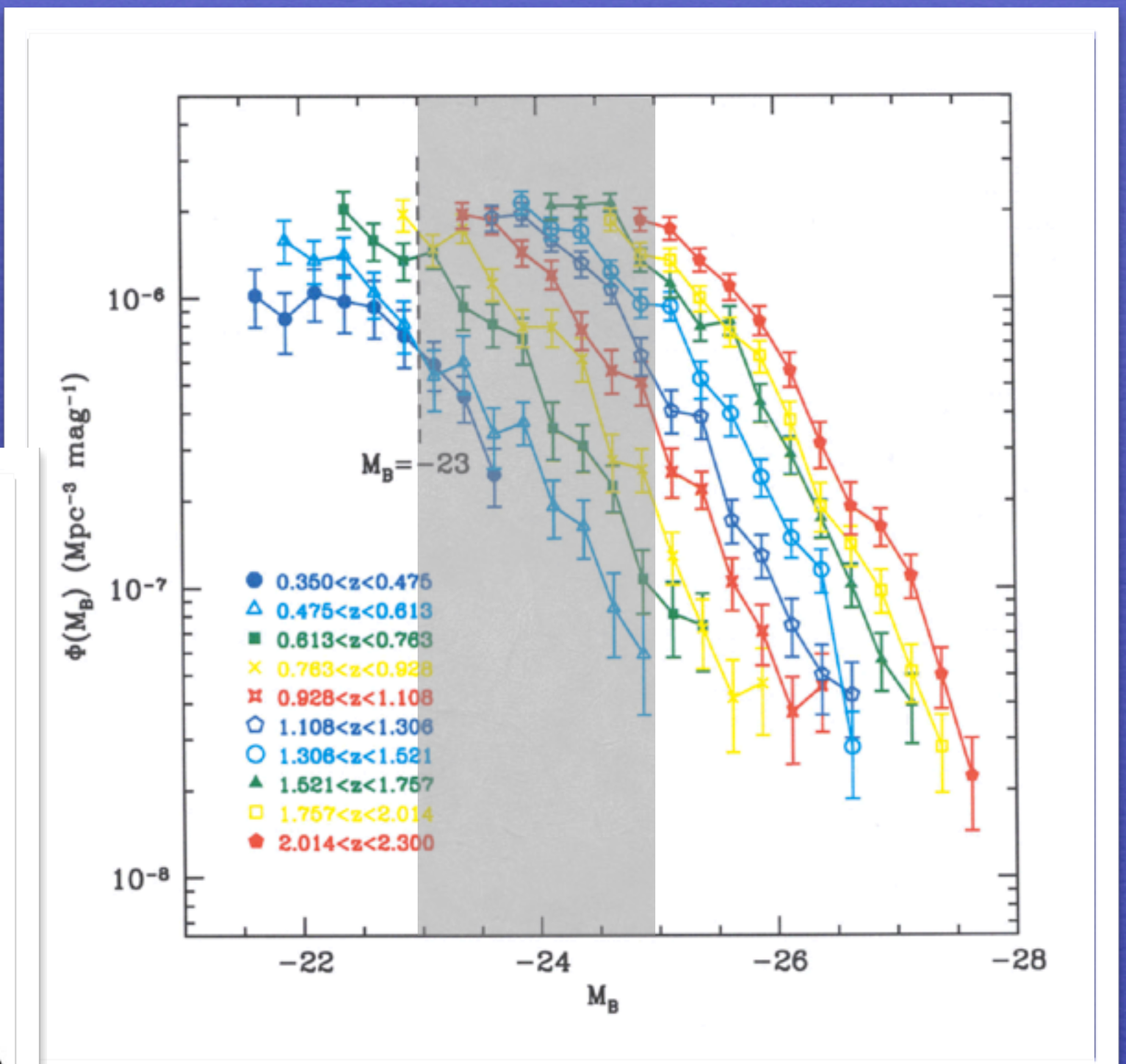
Selection effects for flux limited surveys



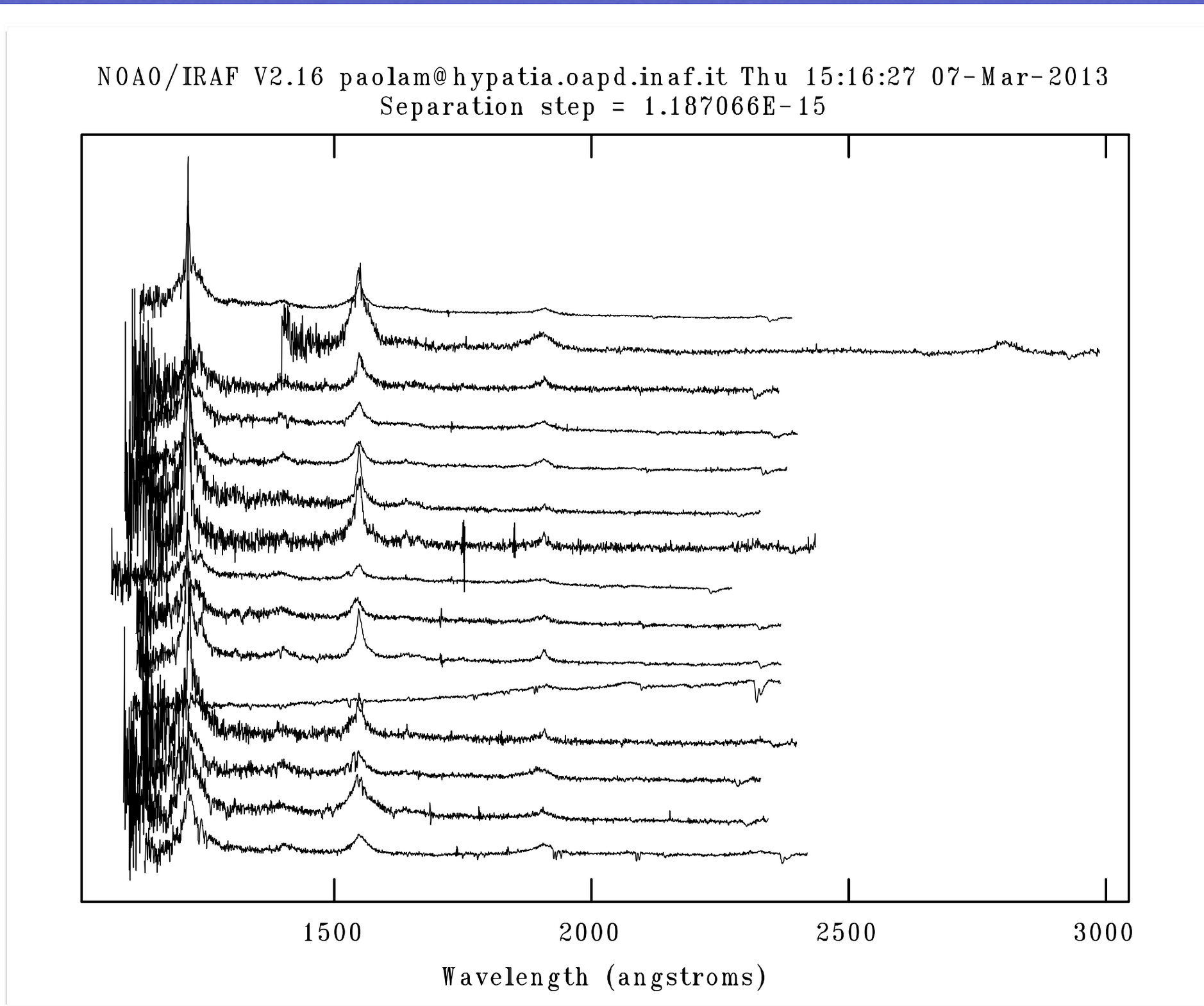


Luminosity functions



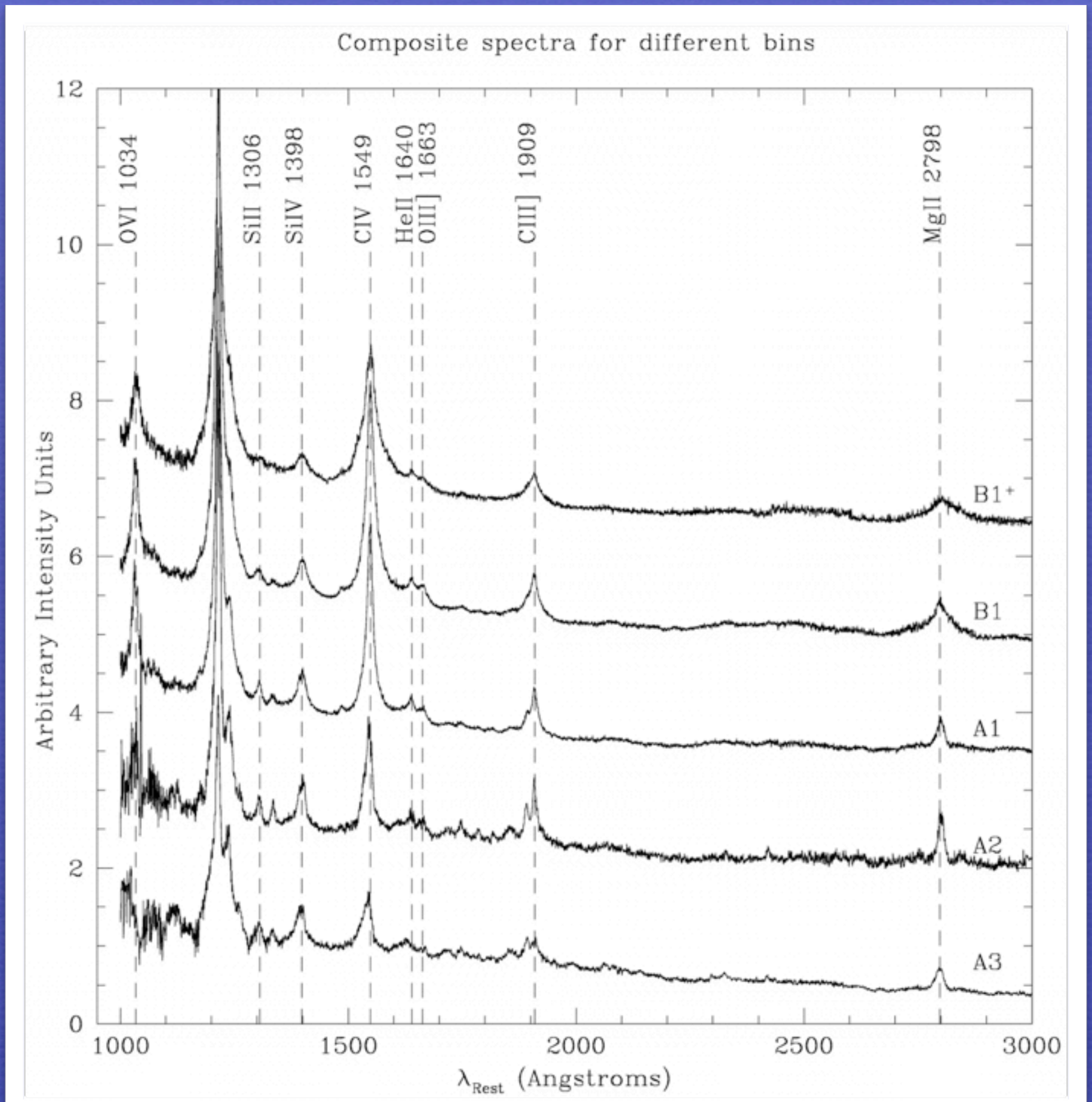


Do we need more quasars?



UV spectral systematic changes along E1

Bachev et al. 2004; Negrete et al. 2012



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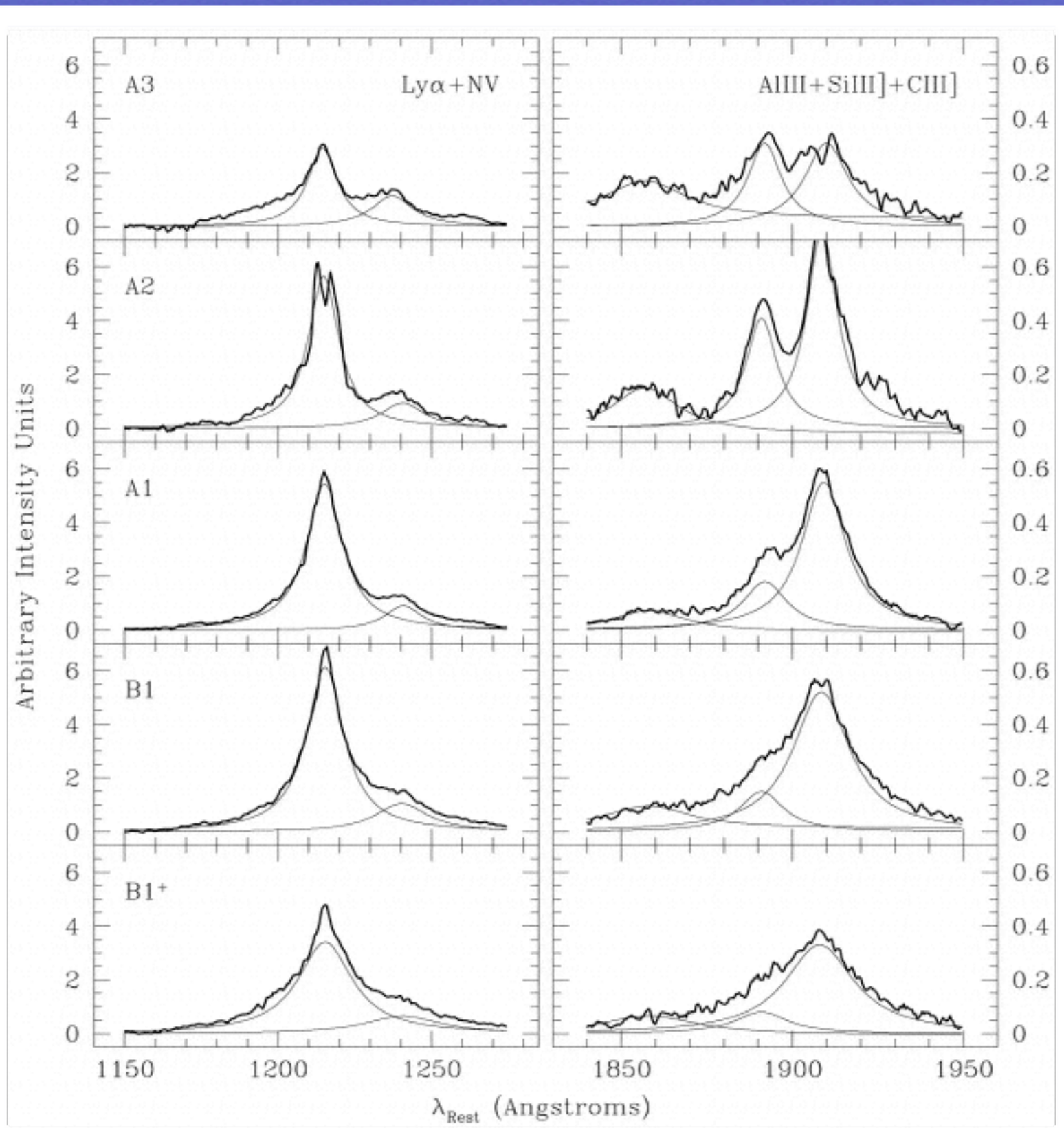
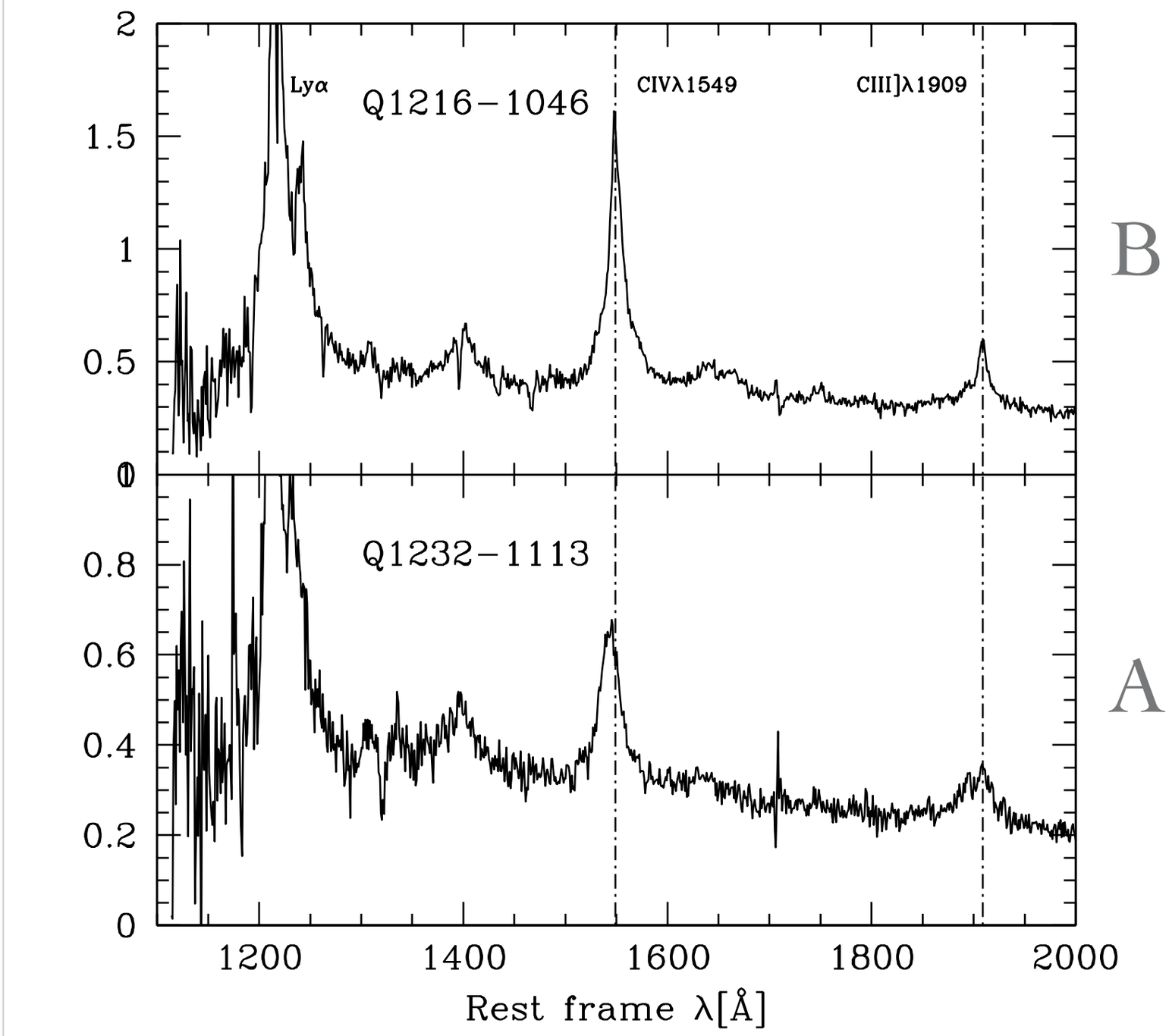


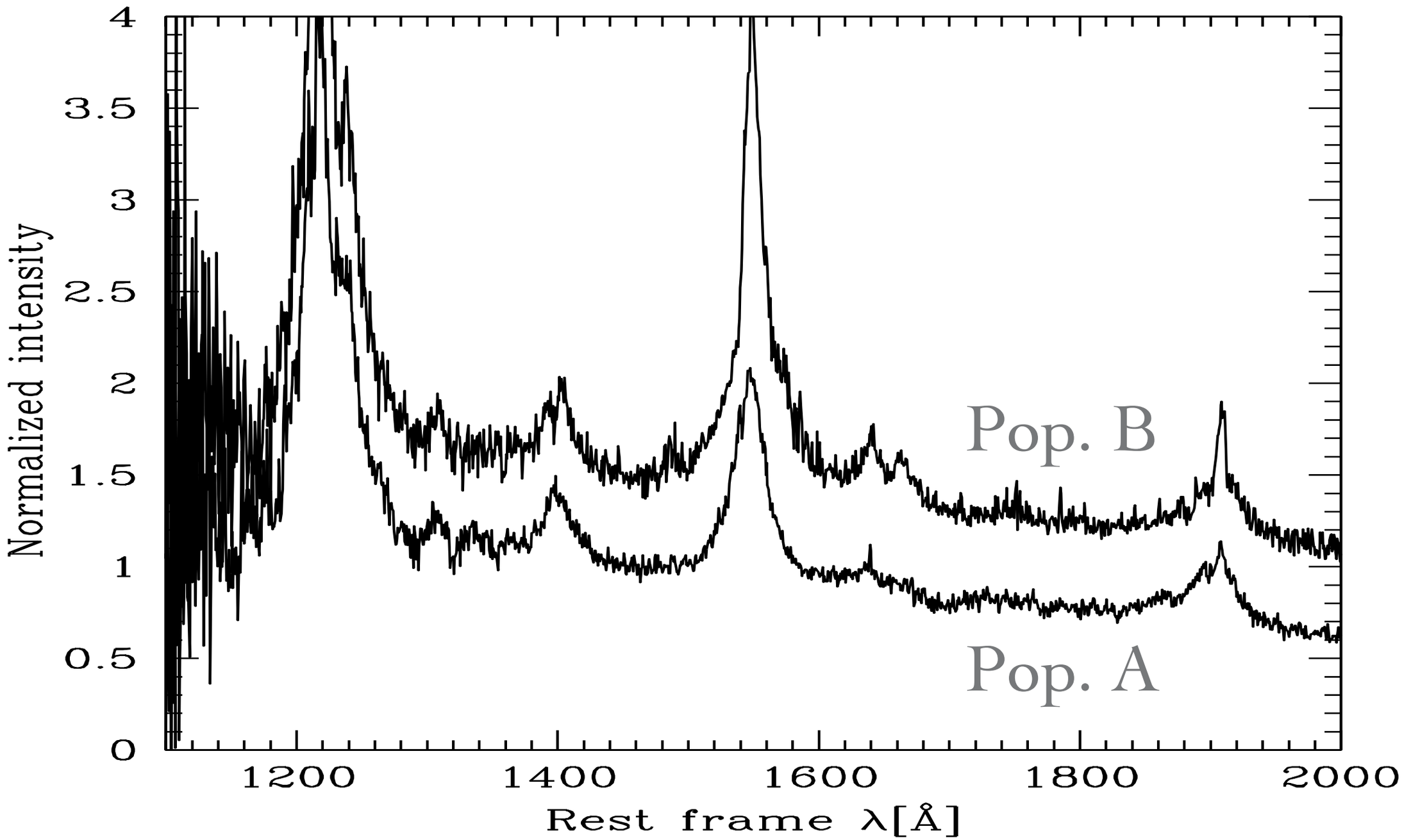
Pop. A and B at high z: two representative sources



B

A

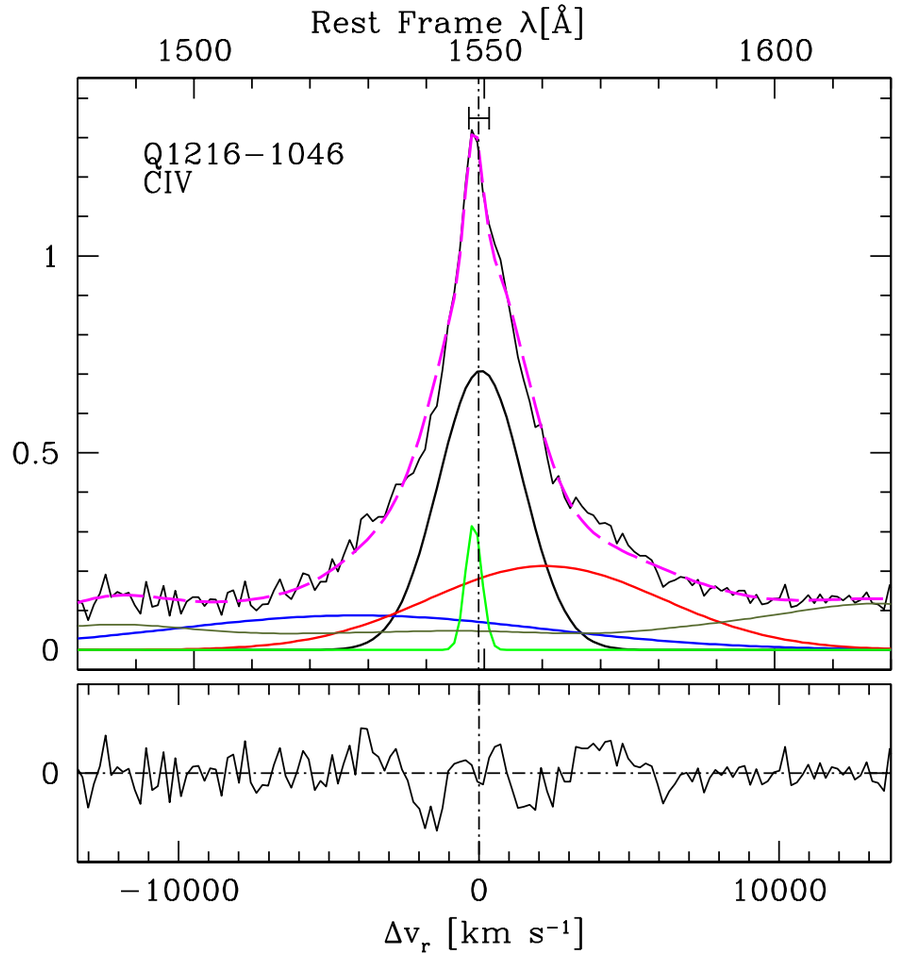
Pop. A and Pop. B composites

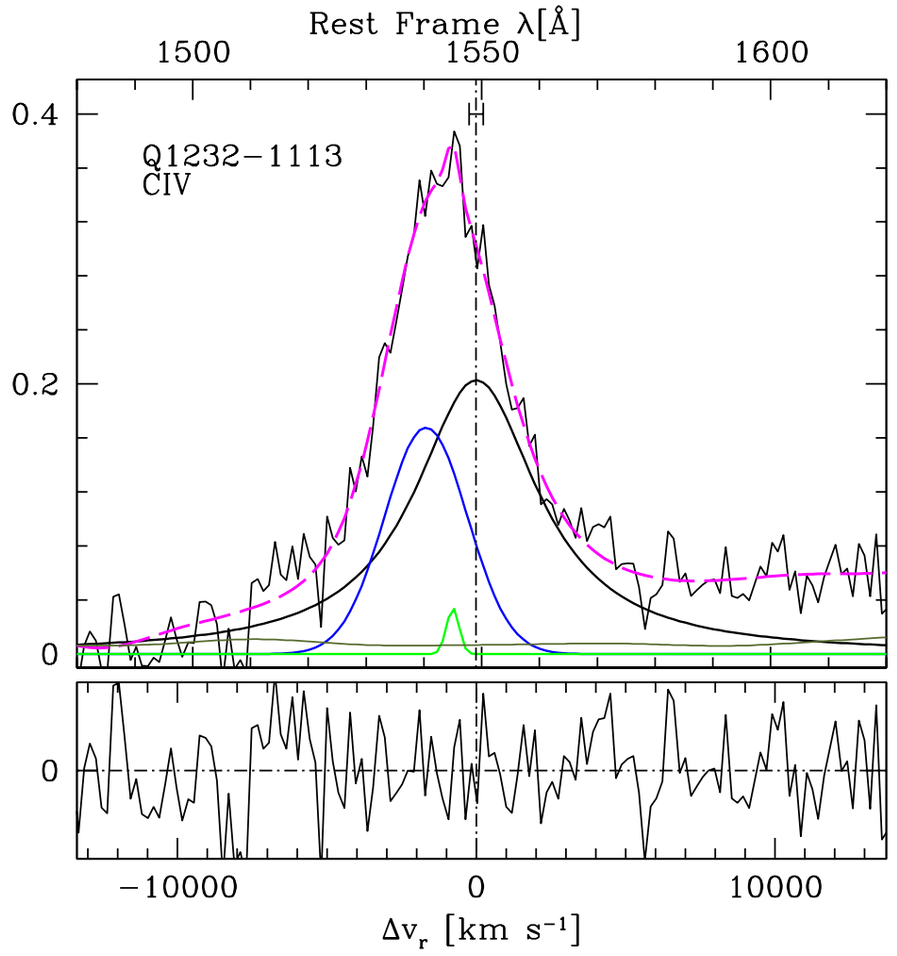


Disk- (B) and wind-dominated (A) sources

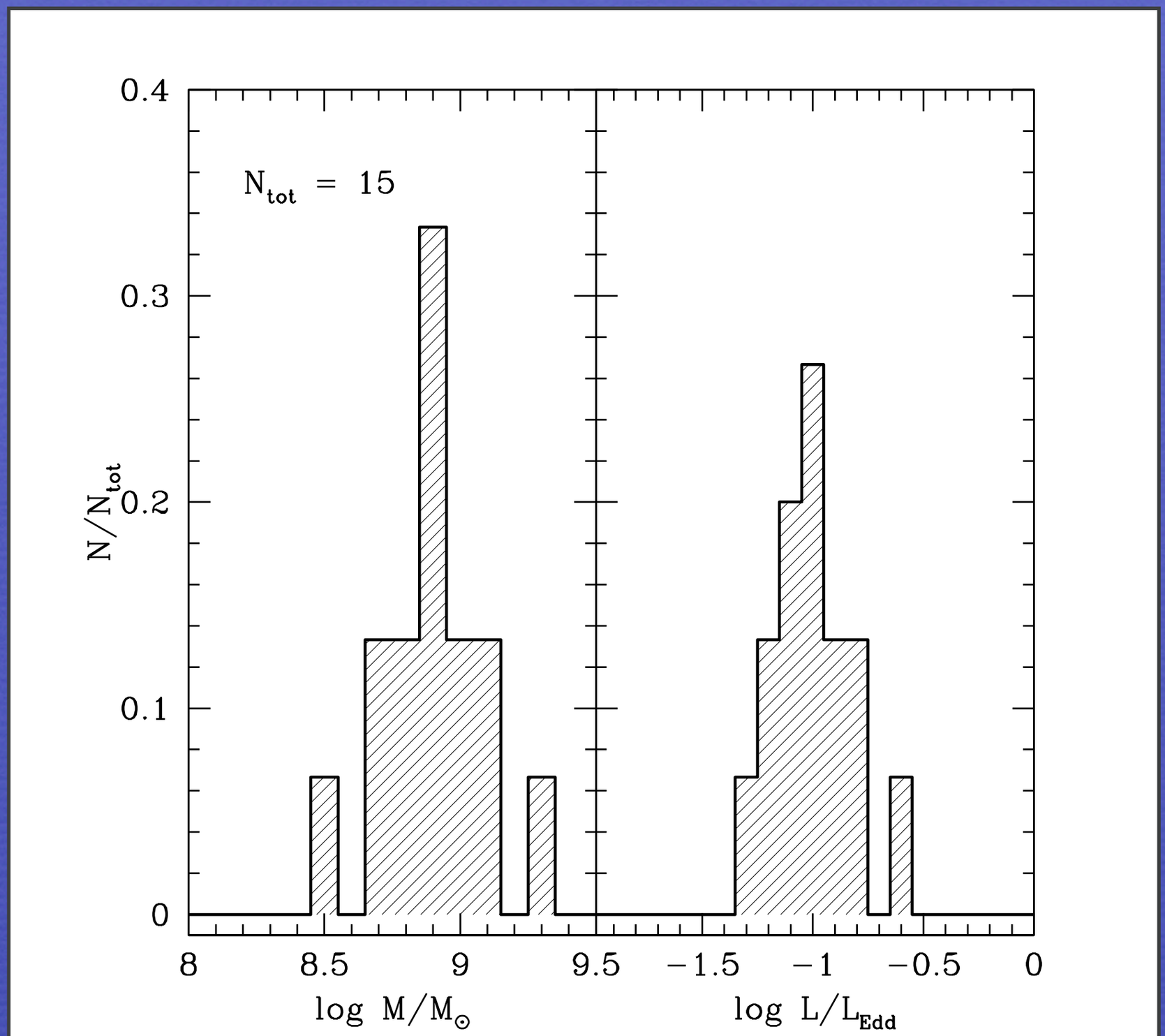
Pop. B

Pop. A

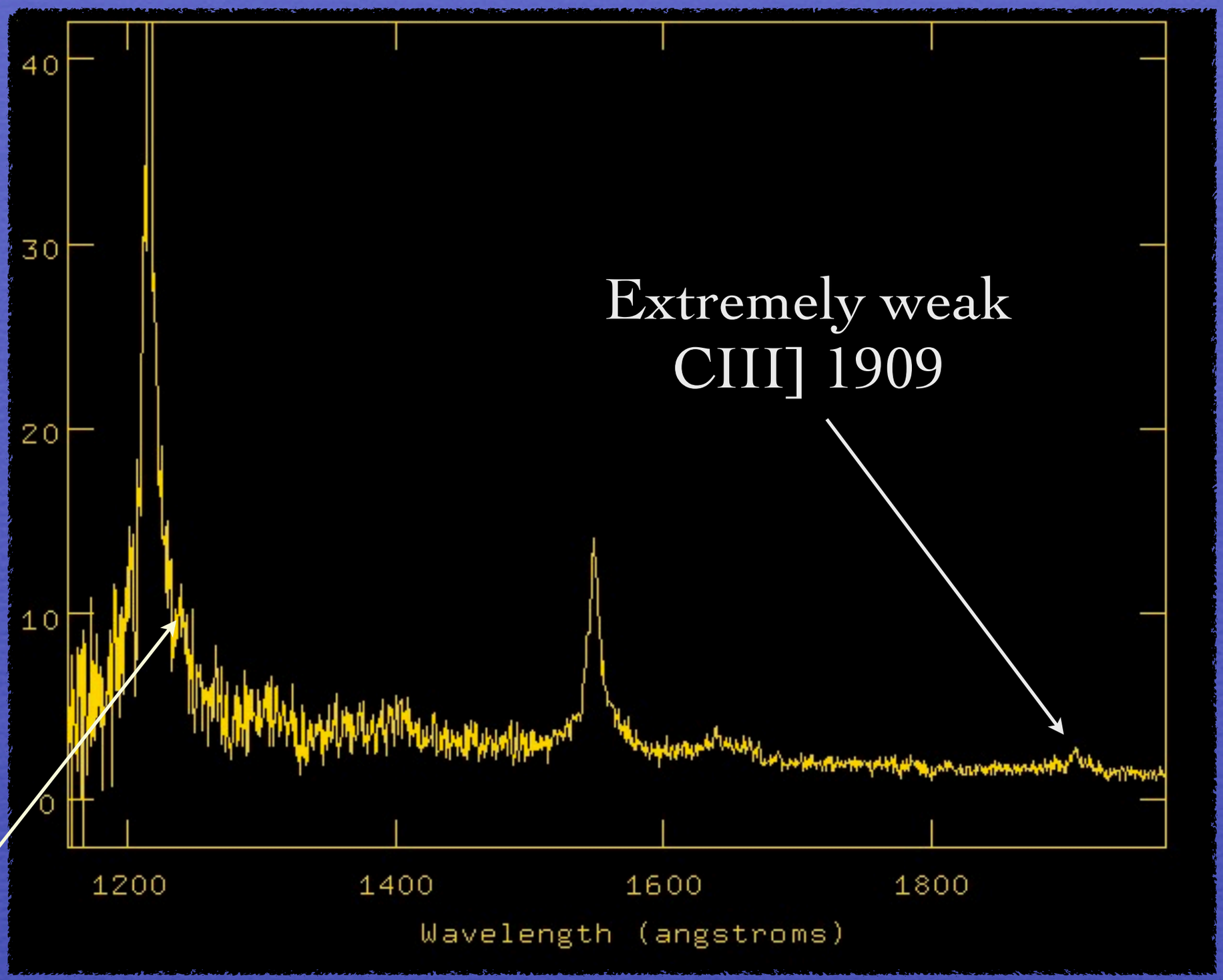




Distribution of black hole mass and Eddington ratio

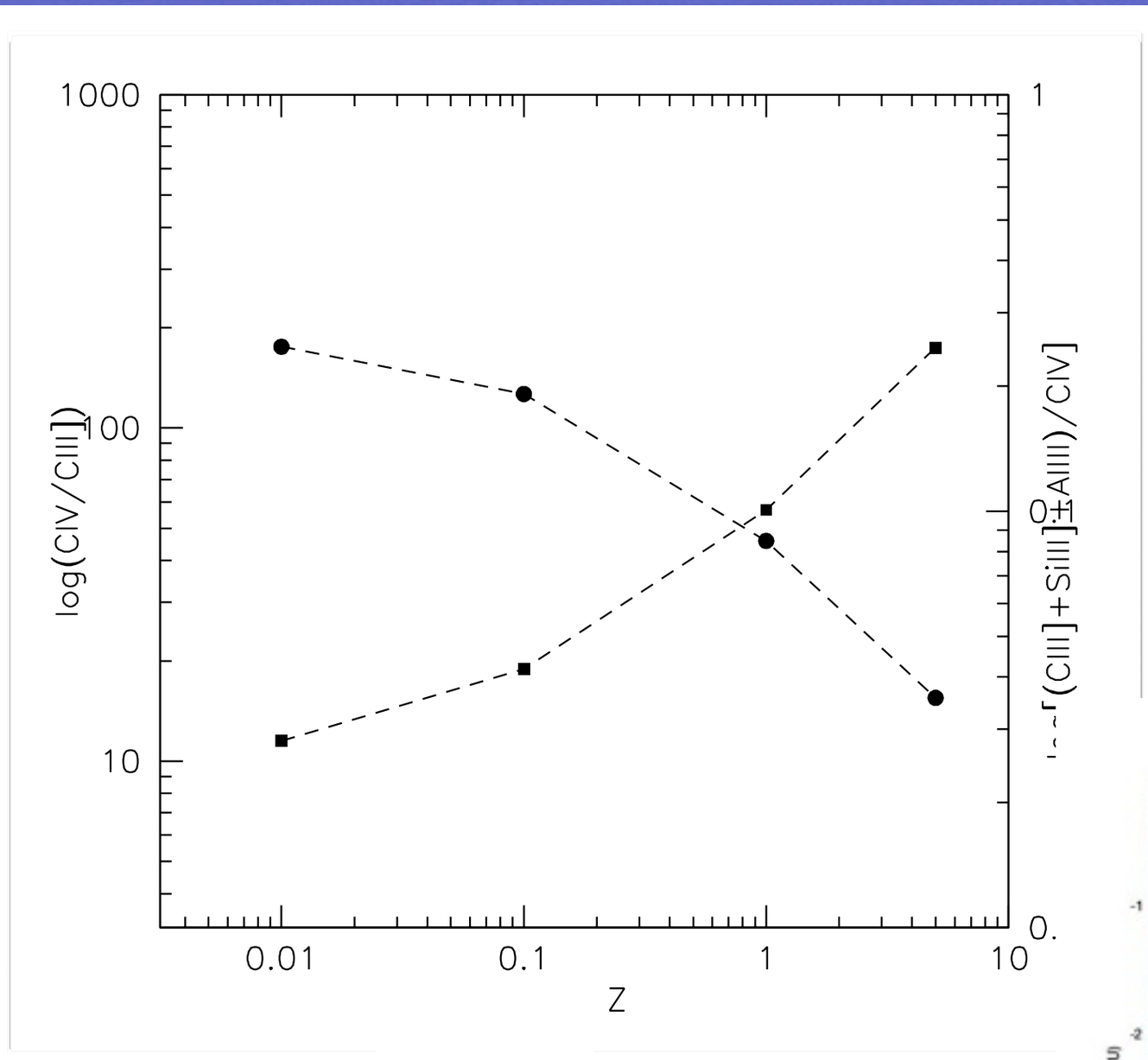


Pop. B Q1640.8+4056

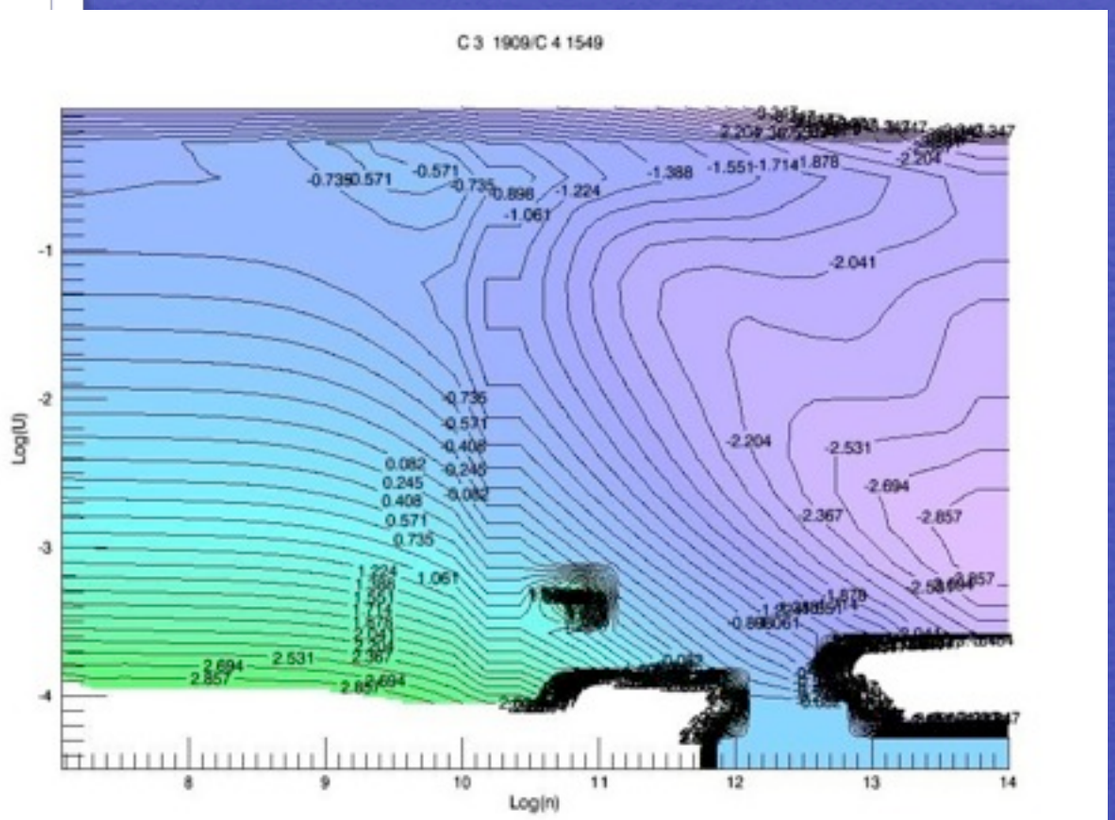


NV 1240/Lyα ~ 0.01 $\Rightarrow$ 0.01 < Z/Z_{sol} < 0.1

Metallicity trends



Metallicity: the CIII]/CIV ratio depends on Z because of T_e increasing with Z decreasing but is not an ideal indicator



The NV/Lyα supports low metallicity

	Z/Z_{sol}			
	0.01	0.10	1.00	5.00
NV/Lyα	-2.457	-1.807	-1.648	-1.666

Conclusions

Pop. A and Pop. B distinction holds also at high z

A sizable population of low Eddington ratio accretors

A low metallicity population of quasars

No evolutionary Baldwin Effect

and…

… Luminous Quasar growth is expected to occur at very early cosmic epochs: an evolved population accreting modestly existed already 3 Gyr after the Big Bang.