

75 hot subdwarf stars observed in LAMOST DR1



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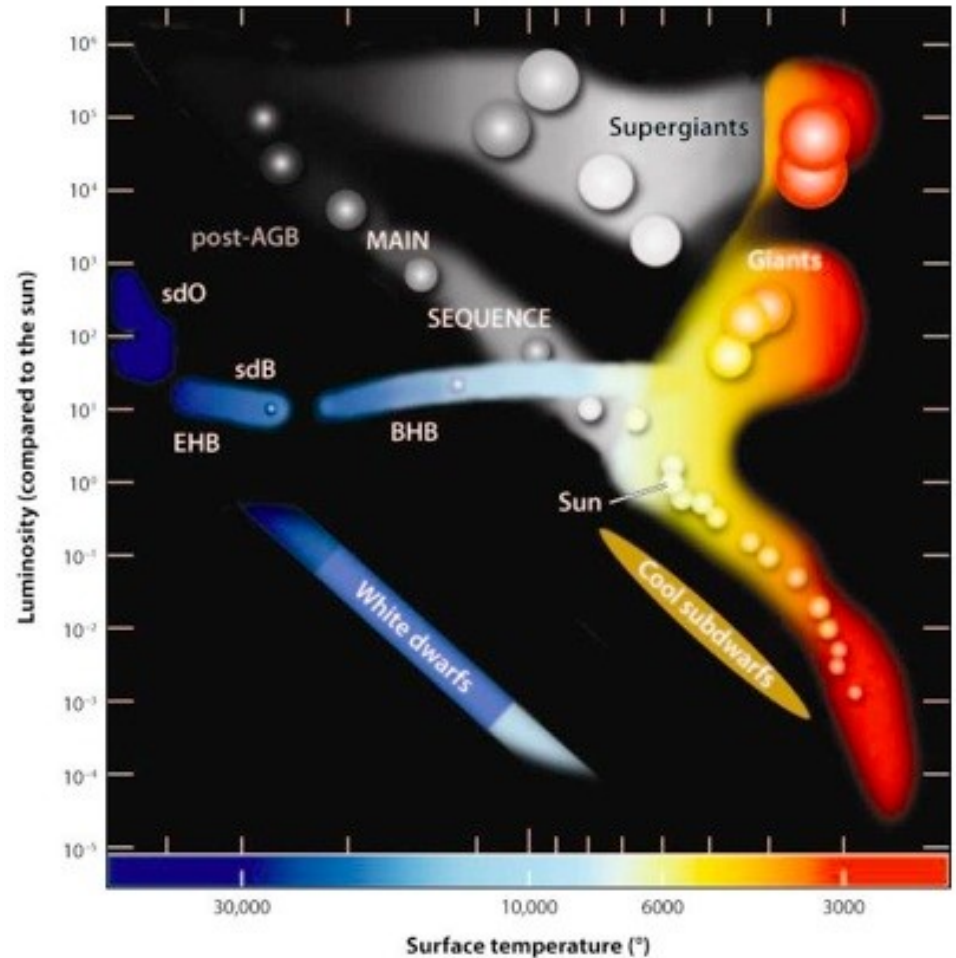
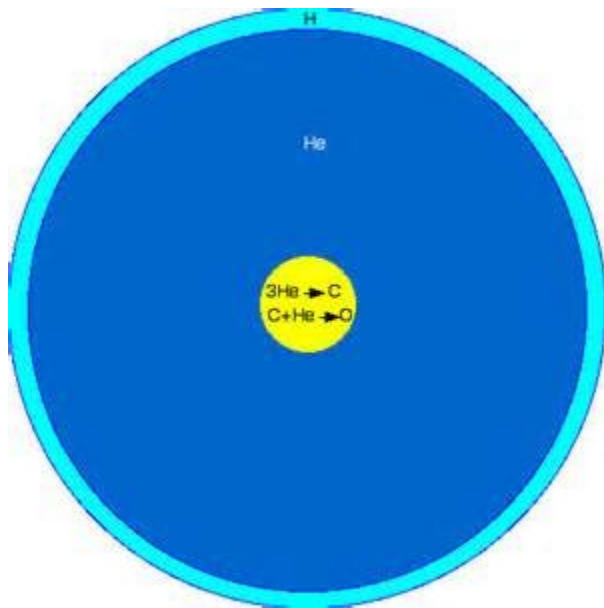
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Outline

- Hot subdwarf
- Sample selection
- Atmospheric parameters
- Results & discussions

Hot subdwarf

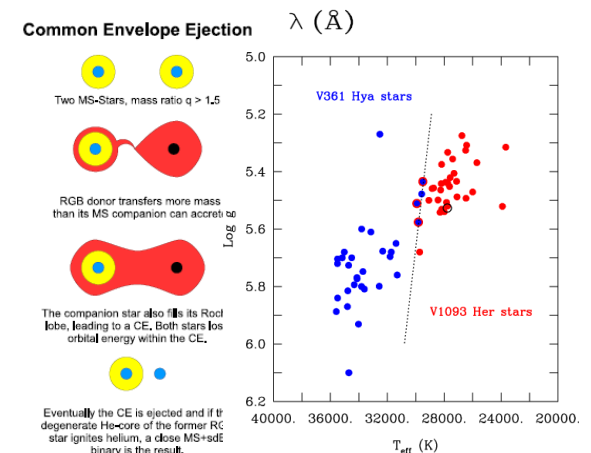
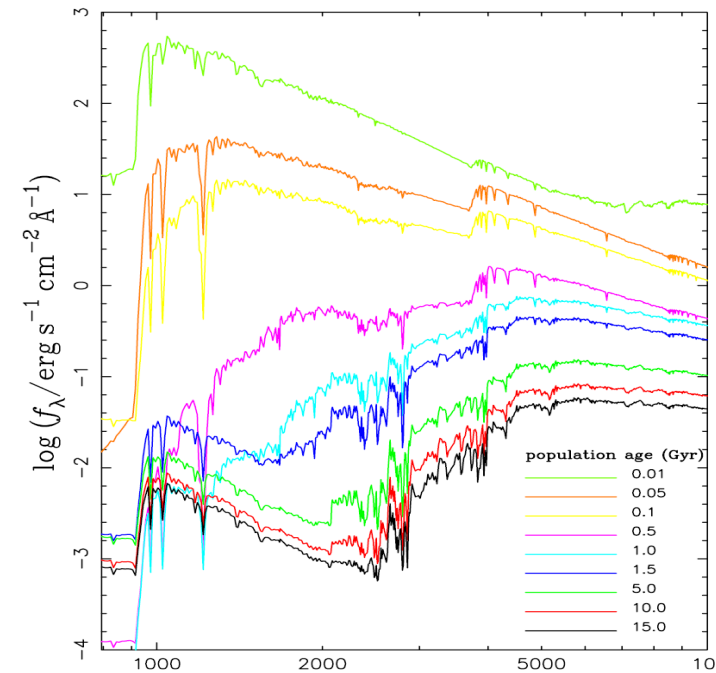


Hot subdwarfs II

➤ Significance

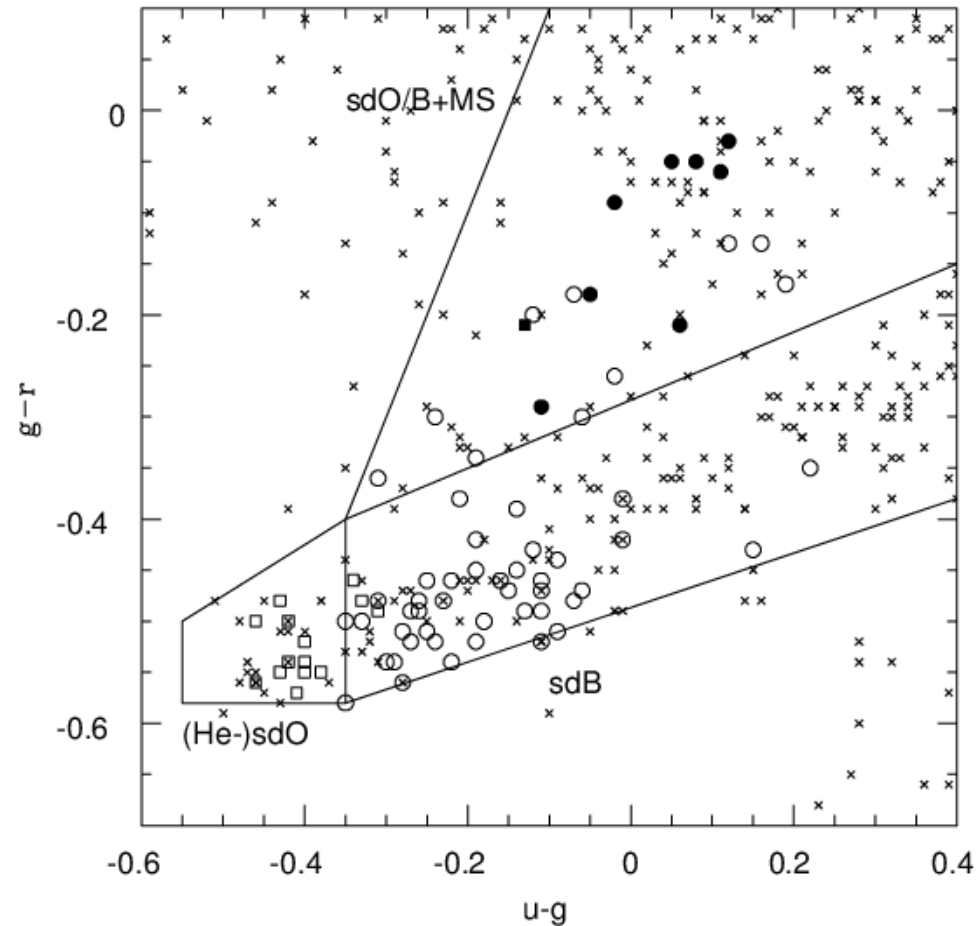
- ✓ UV-upturn of Elliptical Galaxies or the bulges of Spiral Galaxies (Han et al. 2007).
- ✓ Progenitor of Ia supernova or hypervelocity stars (Wang et al. 2012)
- ✓ Common envelope evolution (Han et al. 2002).
- ✓ Asteroseismology (Charpinet et al. 2010)

The formation and evolution ?



Sample selection

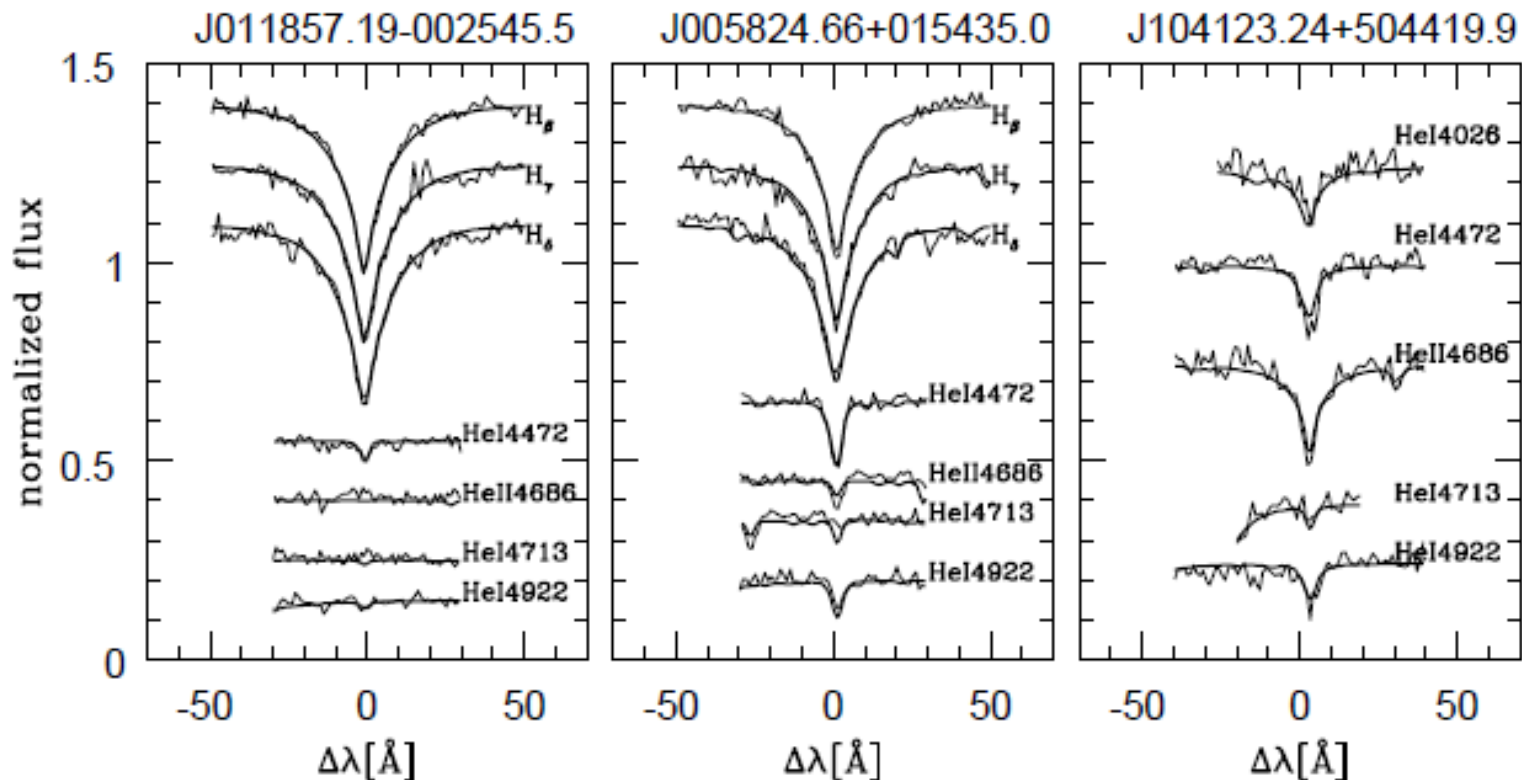
- ✓ LAMOST DR1 & SDSS 9 photometry.
- ✓ Color criterion
 $-0.6 < u - g < 0.4$ &
 $-0.7 < g - r < 0.1$
(Geier et al. 2011).
- ✓ A visual inspection.
- ✓ 75 hot subdwarfs
(60 sdBs + 15 sdOs),
9 stars have the
clear Mg I triplet
lines.



open squares: sdOs, open circles: sdBs,
filled square / circles : sdO/sdB + Mg I triplet lines

Atmospheric parameters

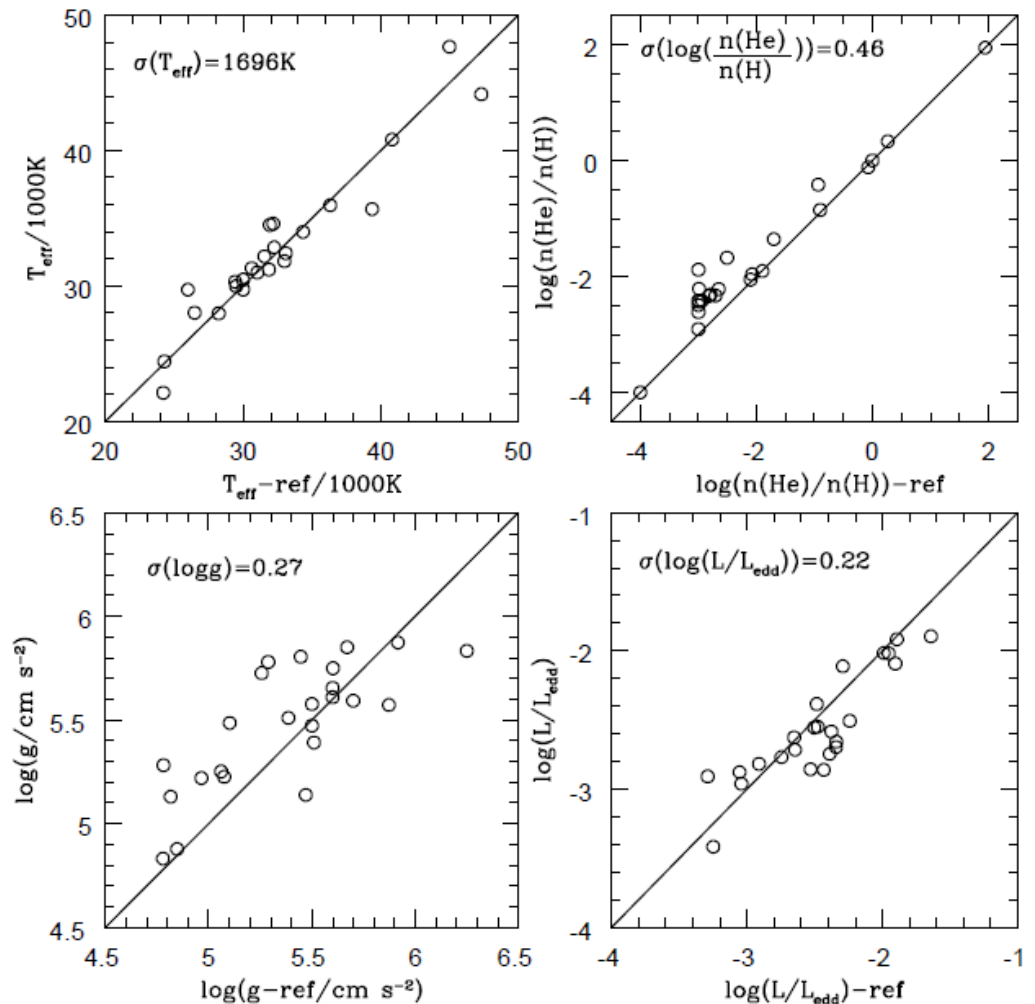
- ✓ H+He LTE model atmospheres T: 10kK-50kK
logg:4-6, n(He)=0.001---0.999 (Jeffery et al. 2001).
- ✓ Fit hydrogen and helium line profiles.



Atmospheric parameters II

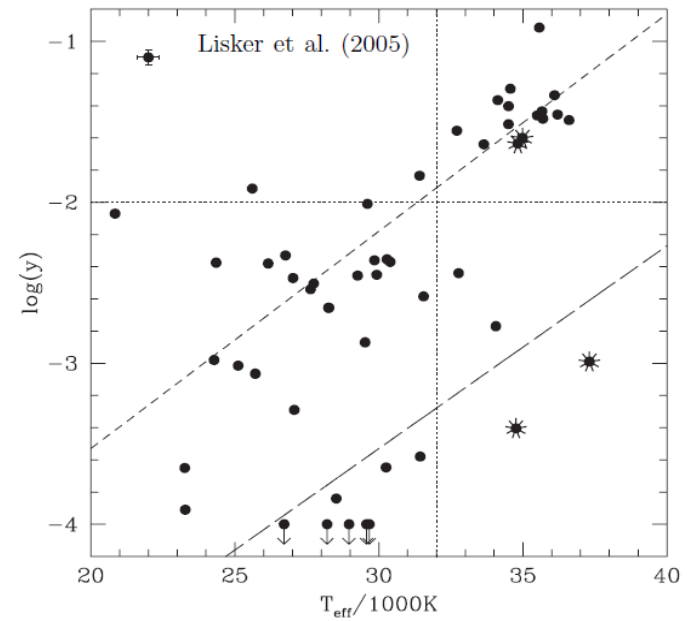
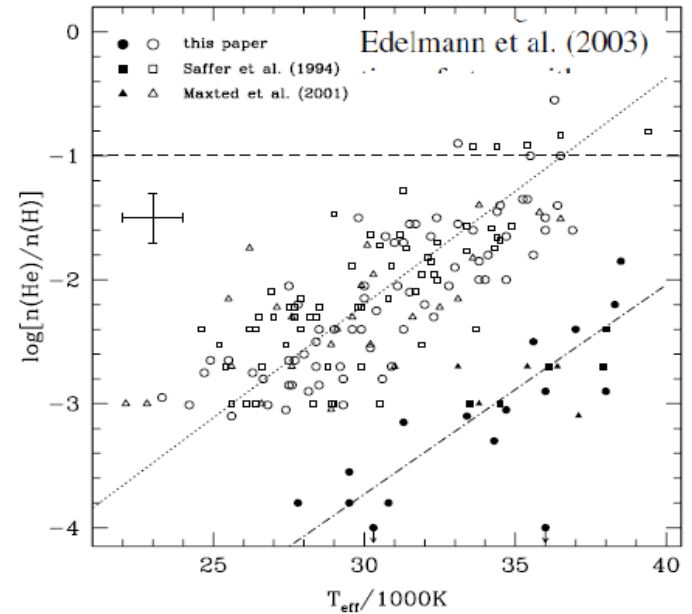
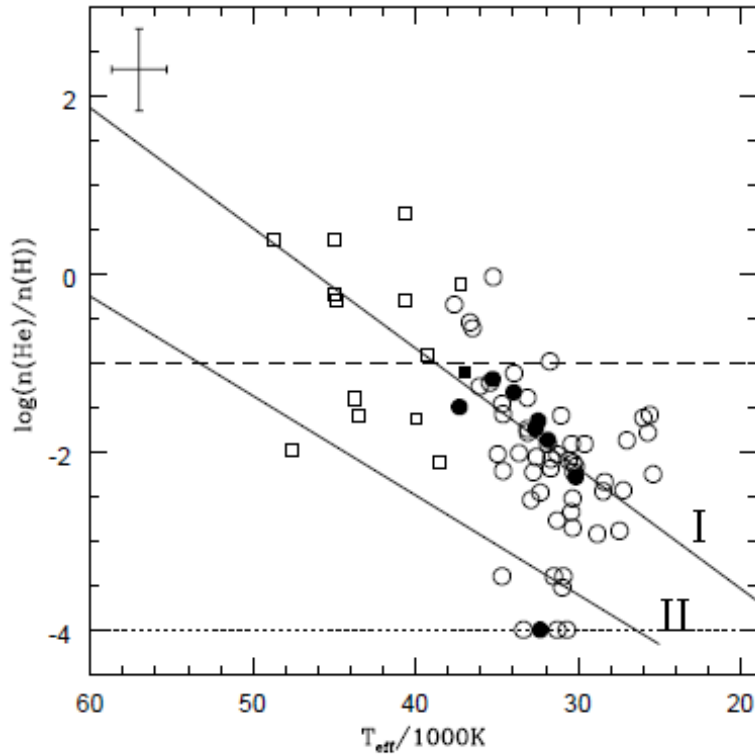
- ✓ The test of atmospheric parameters.

A known sample with
atmospheric parameters
& LAMOST DR1 & a visual
inspection
24 hot subdwarfs

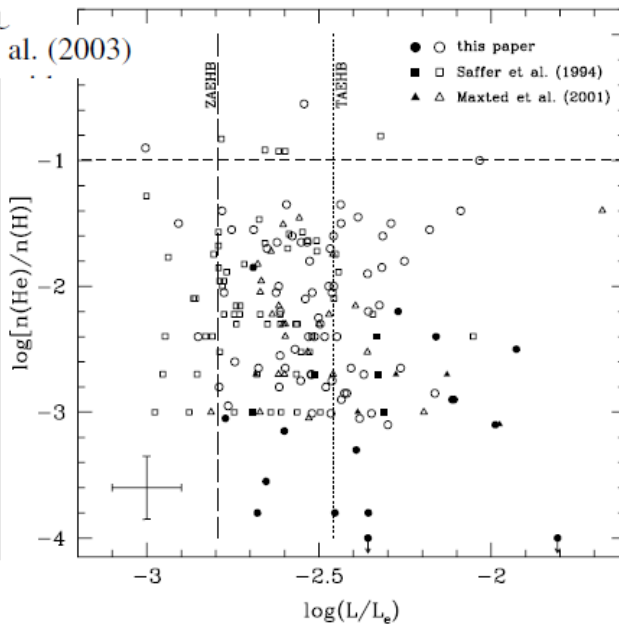
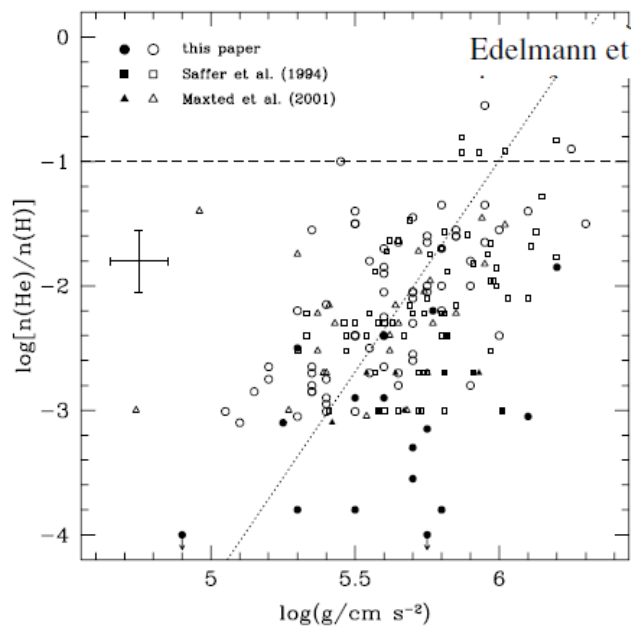
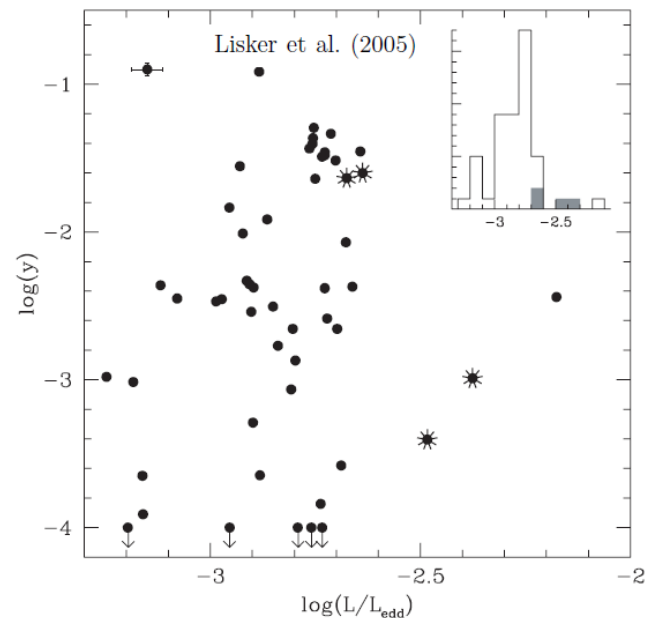
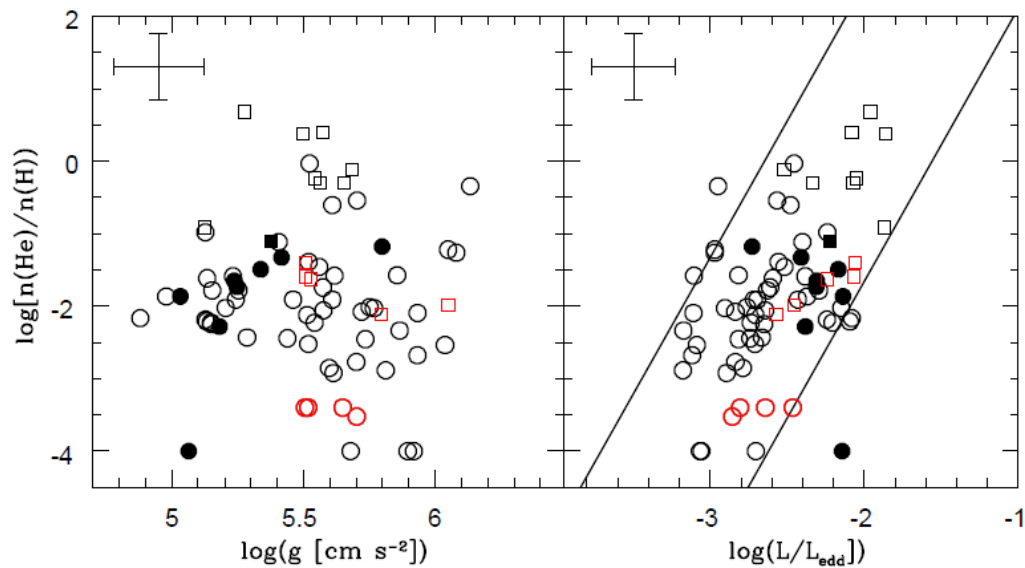


Results & Discussions

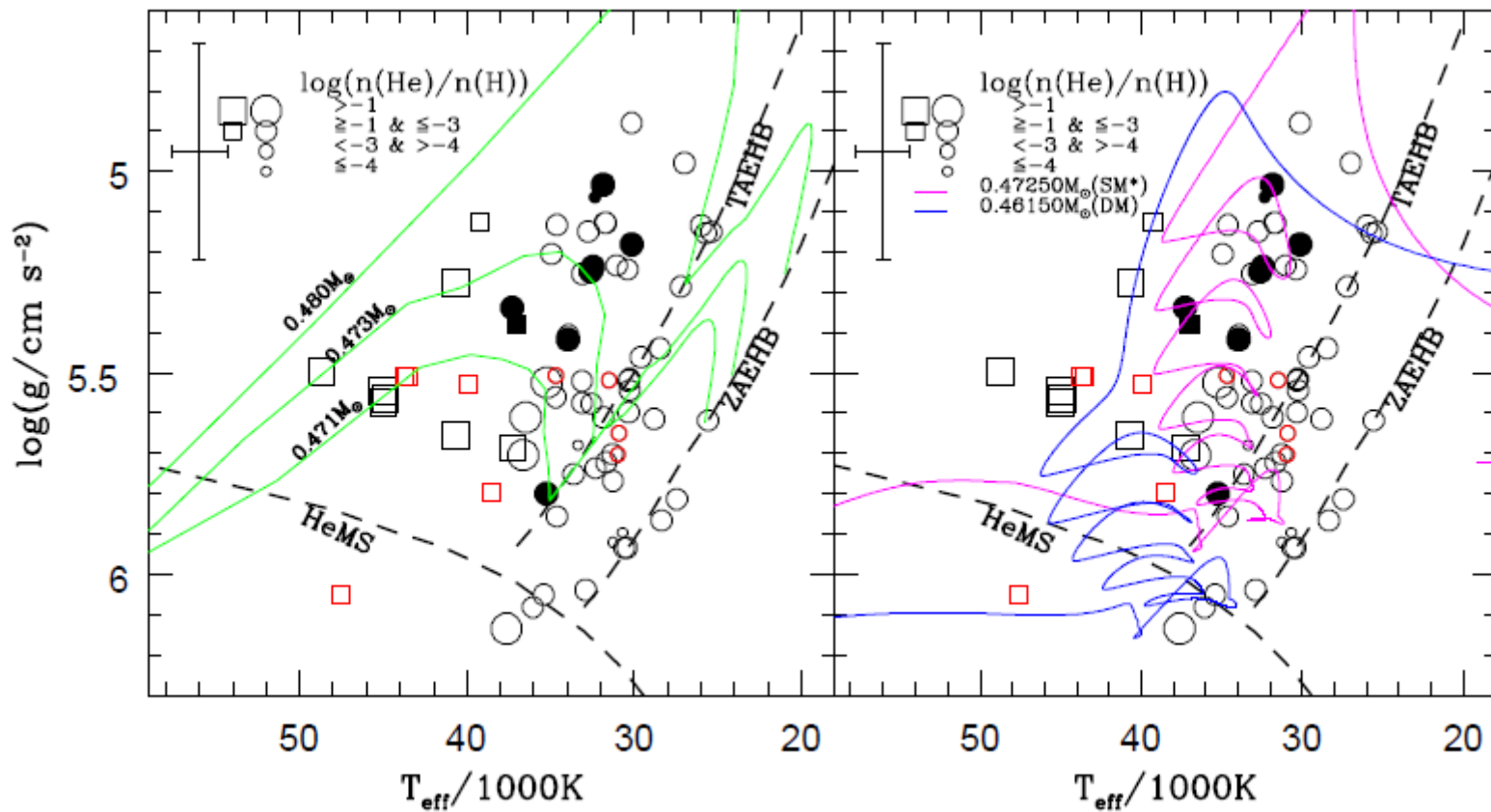
➤ T_{eff} -- Helium abundance



➤ $\log g / L$ -- Helium abundance



✓ T--logg



Dorman et al. (1993)

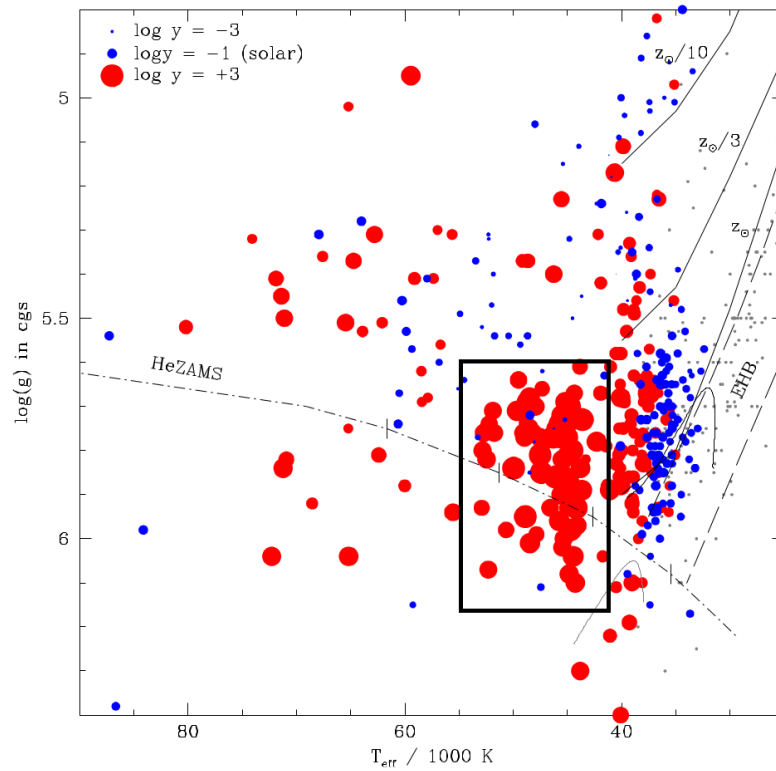
Miller Bertolami et al. (2008)

Summary

- 75 hot subwarfs (15sdOs, 60 sdBs) are identified in LAMOST DR1. 9 stars have Mg I triple line in spectra. Their atmospheric parameters are measured by fitting the He and H line profiles. 24 known hot subdwarfs are used to test atmospheric parameters given by us.
- Our sample shows that the larger the temperature, the larger the helium abundance/ luminosity, no apparent correlation between gravity and helium abundance. Two sdB's distinct sequences in the T---helium abundance plane, found by Edelman et al. (2003), can be clearly seen from our samples, but the fraction is far less than that reported by them.
- In T—logg plane, their formation and evolution are discussed and may be involved in complex physical process.

The next work

$$\alpha_{\text{CE}} |\Delta E_{\text{orb}}| > |E_{\text{gr}} + \alpha_{\text{th}} E_{\text{th}}|$$



Thank you