

Data Mining and Processing of Ground-based Observations for ESP-ELS in CU8

6th GBOG meeting
Nice, November 18 2009

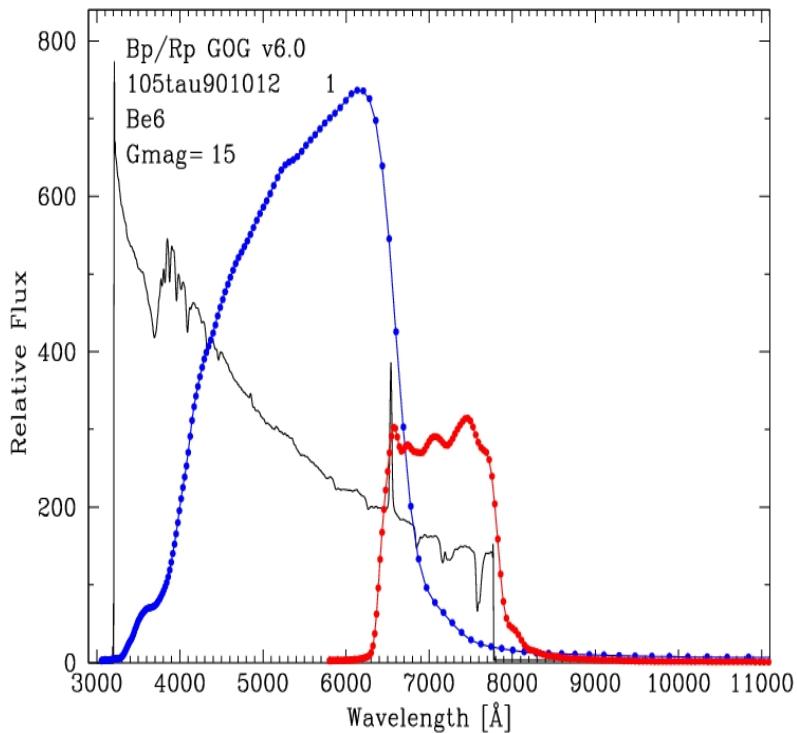
Alex Lobel
Royal Observatory of Belgium

On-line digital spectral catalogs and telescope archives of optical stellar emission line spectra for GAIA ESP-ELS processing: status Nov. 2009

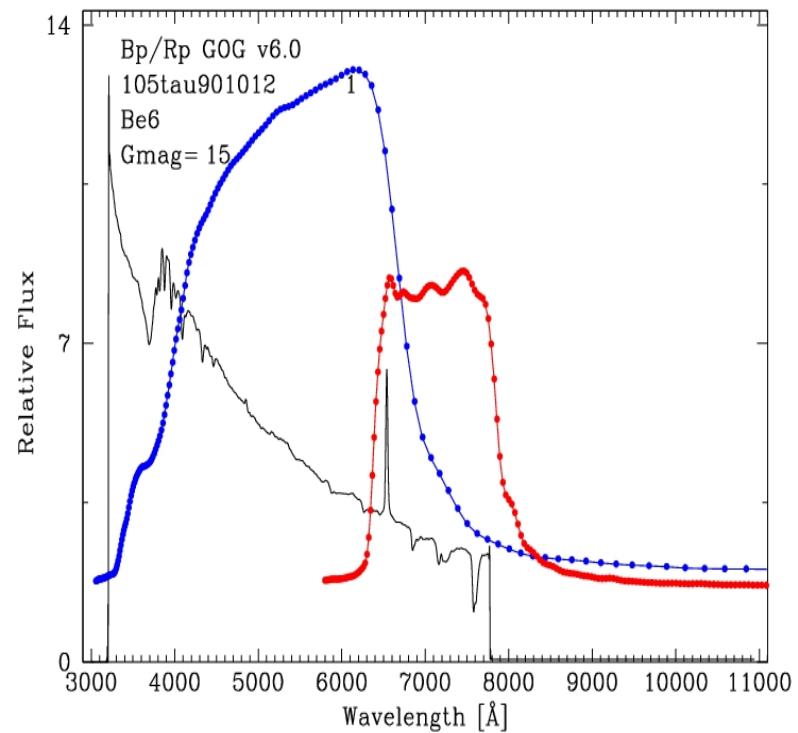
Em. Star Class	No. of Spectra	Archive / Catalog
Be	: 407	: OHP-Elodie Arch + HPOL MAST Arch (Bjorkman & Hoffman 89-94)
AeBe	: 27	: OHP-Elodie + HPOL MAST Arch
PNe	: 748	: MASH Catalog in Vizier (Parker et al. 2006, MNRAS 373, 79)
Pre MS	: 3	: OHP-Elodie Arch
T Tau	: 21	: OHP-Elodie Arch + HPOL MAST Arch
Symb	: 17	: HPOL MAST Arch
WR-WN	: 156	: Vizier (Torres-Dodgen & Massey 1988, AJ 96, 1076) + HPOL MAST
WR-WC	: 59	: Vizier (Torres-Dodgen & Massey 1988, AJ 96, 1076) + HPOL MAST
dMe	: 52	: SDSS-DR5 (West et al. 2008, AJ 135, 785)
Catacl & Nova		
	: 39	: HPOL MAST Arch
RS CVn	: 21	: HPOL MAST Arch
Mira Carb:	70	: Vizier (Barnbaum et al. 1996, ApJS 105, 419)

Total	: 1620	

GOG V6.0 epoch Bp/Rp flux spectra



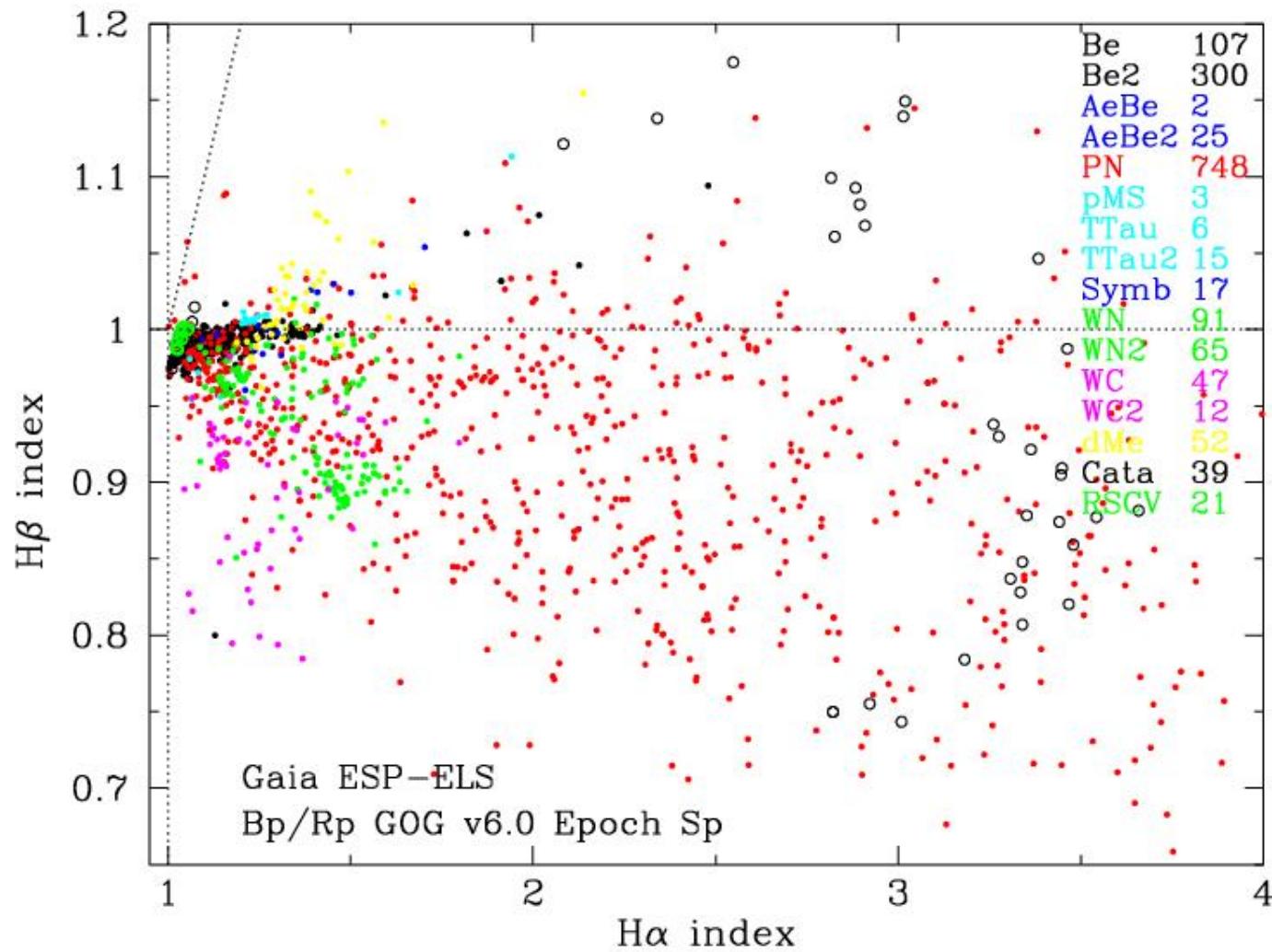
GOG V6.0 epoch Bp/Rp sigma spectra



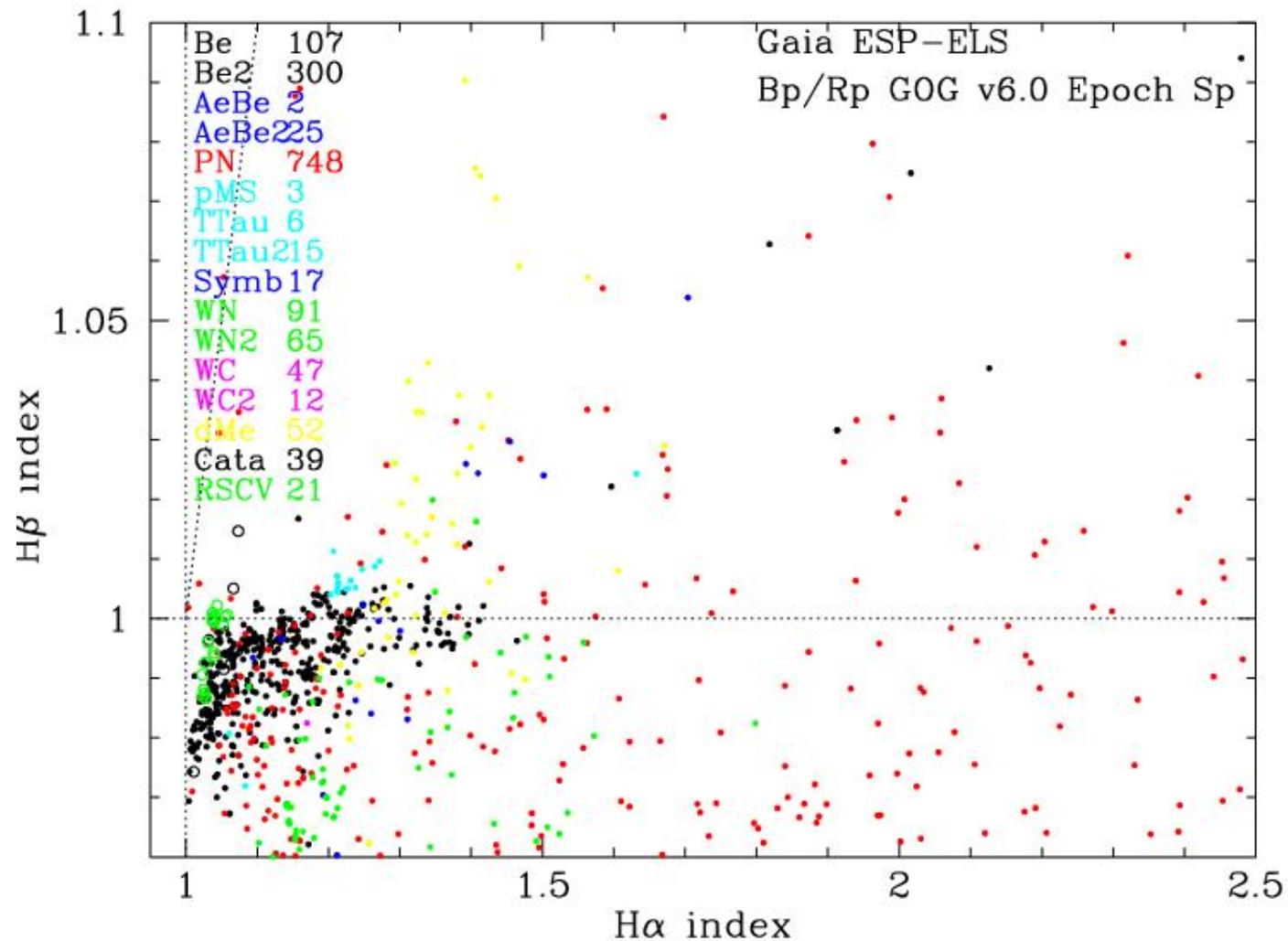
GOG Input spectrum: Be-star 105 Tau B2Ve $V = 5.92$ m.
 $3200 - 7750 \text{ Å}$, $\Delta\lambda = 10 \text{ Å}$

407 Be-star spectra from OHP-Elodie and MAST (HPOL) Archives
 (HPOL spectro-polarimetry no longer available at Kitt Peak)

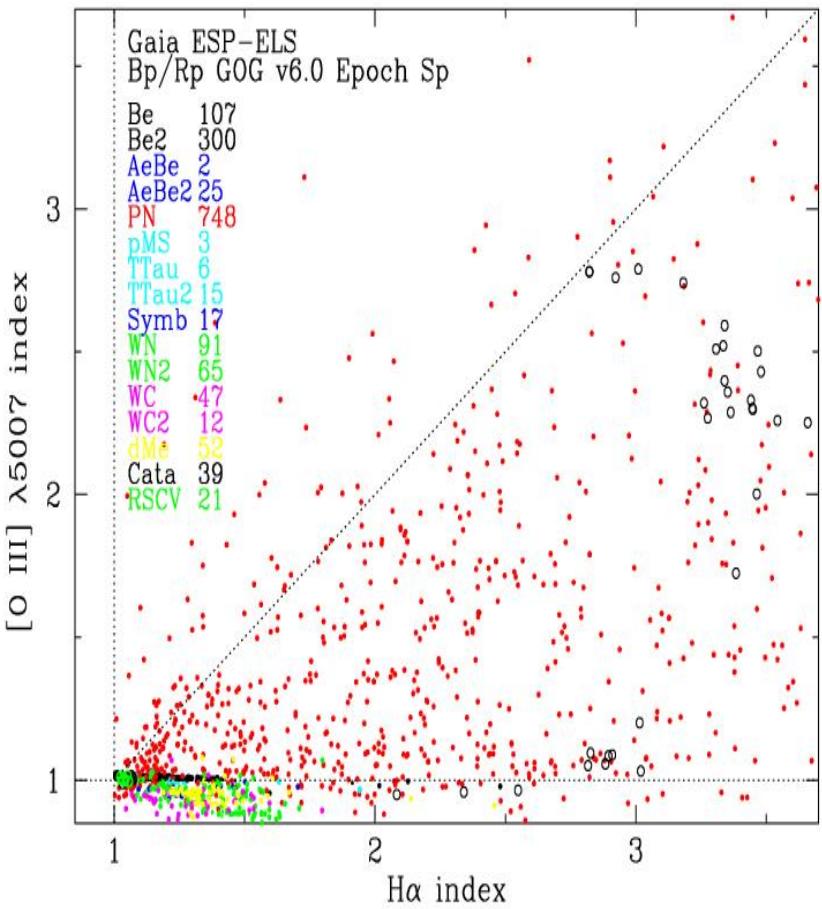
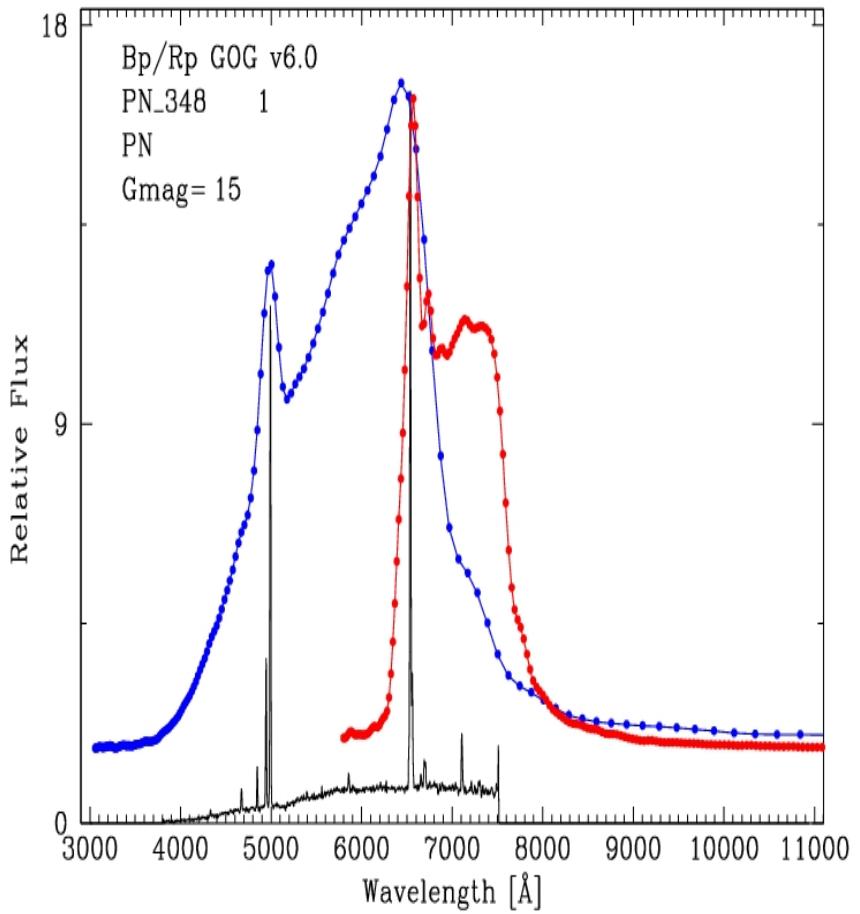
GOG Combined & Epoch Flux and Sigma Bp/Rp spectra computed for $G=15$ m.
 no noise or LSF added so far



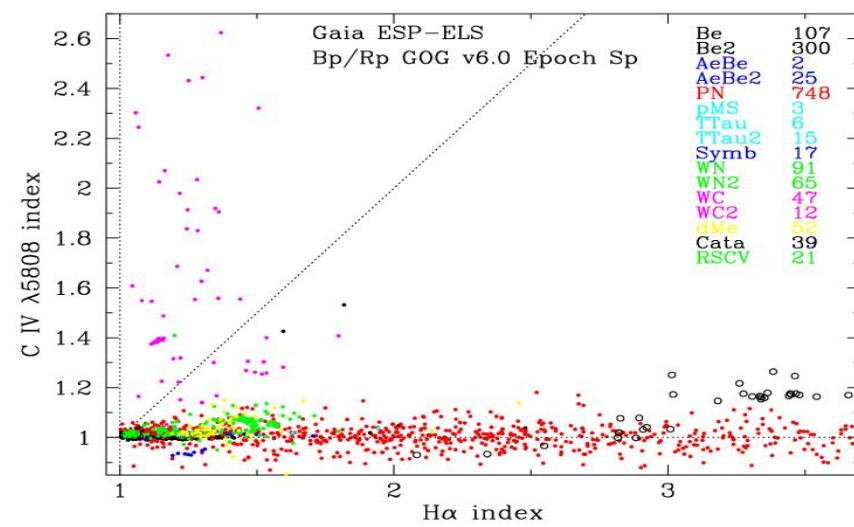
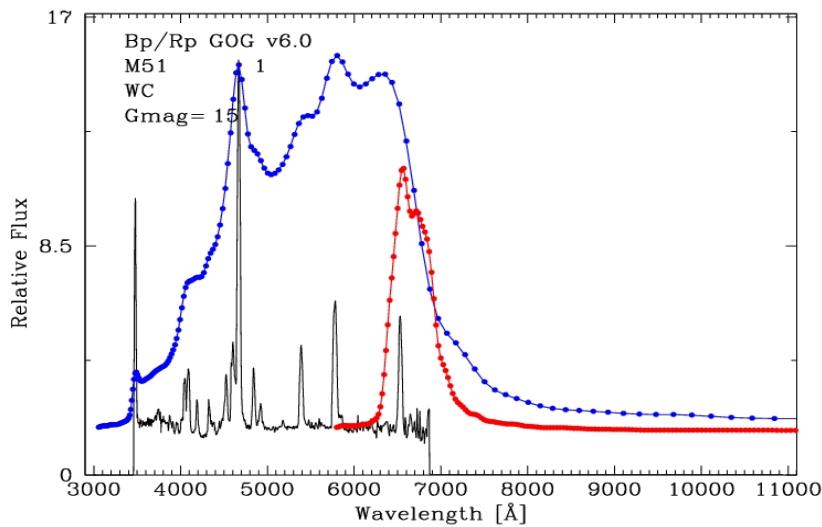
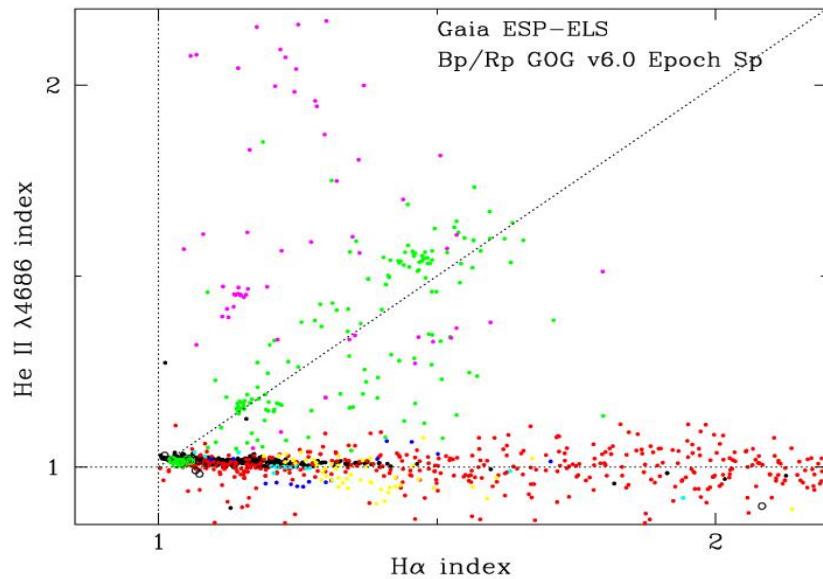
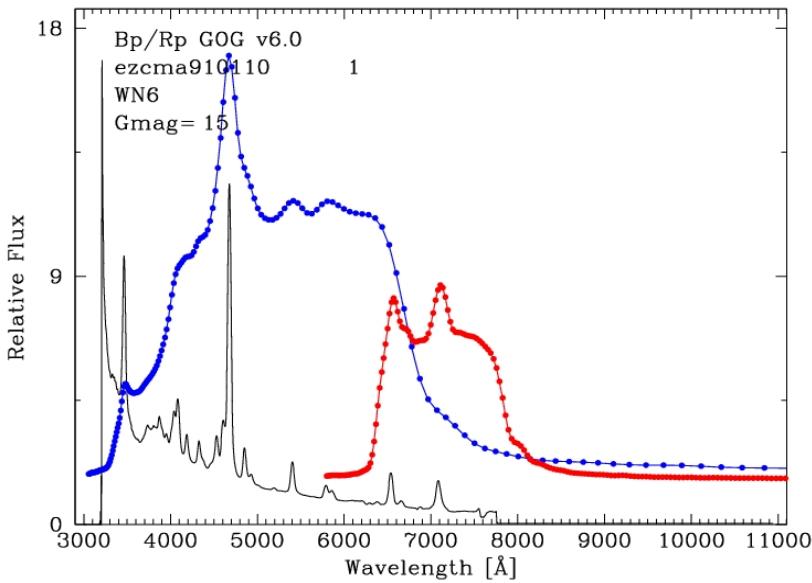
Bp/Rp epoch spectra currently used to define emission line indexes for separating out various emission line star classes



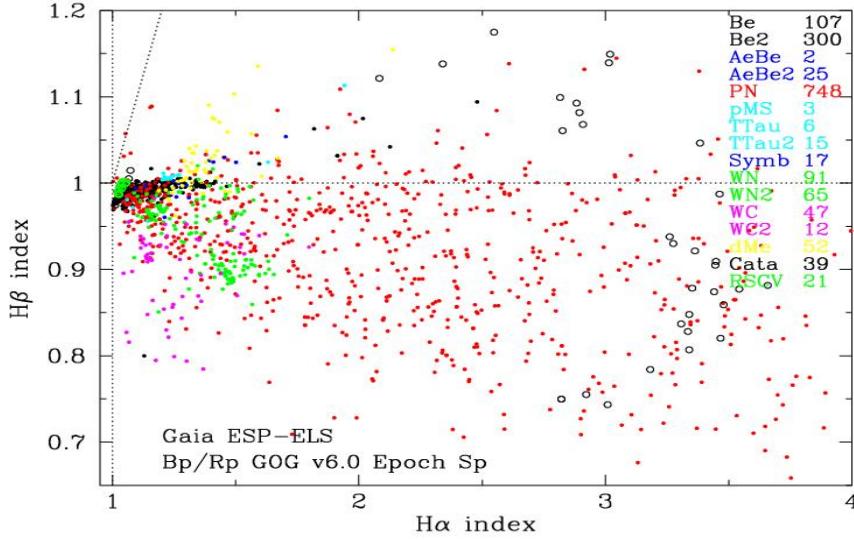
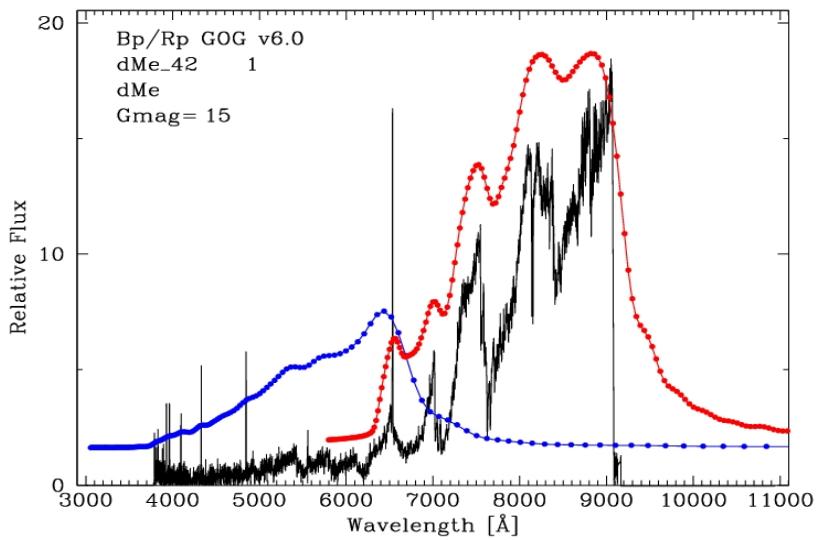
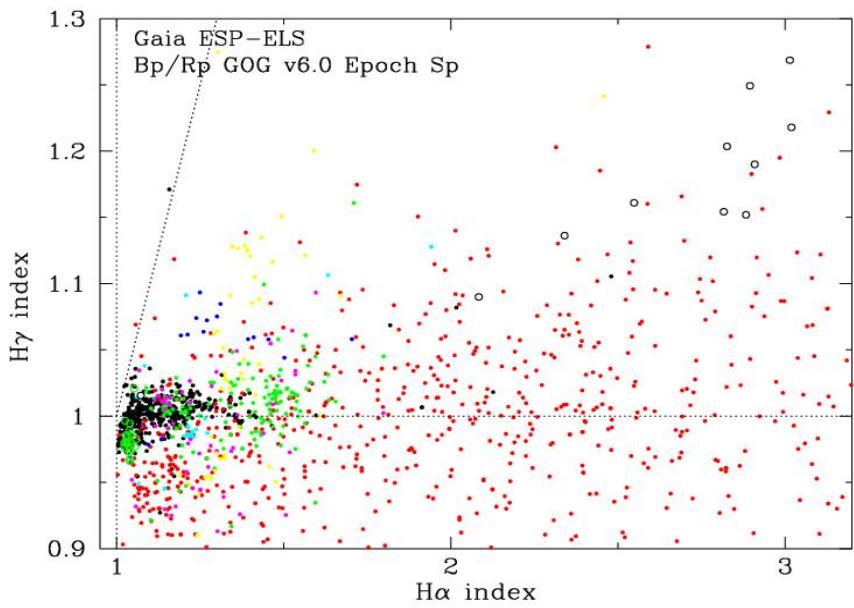
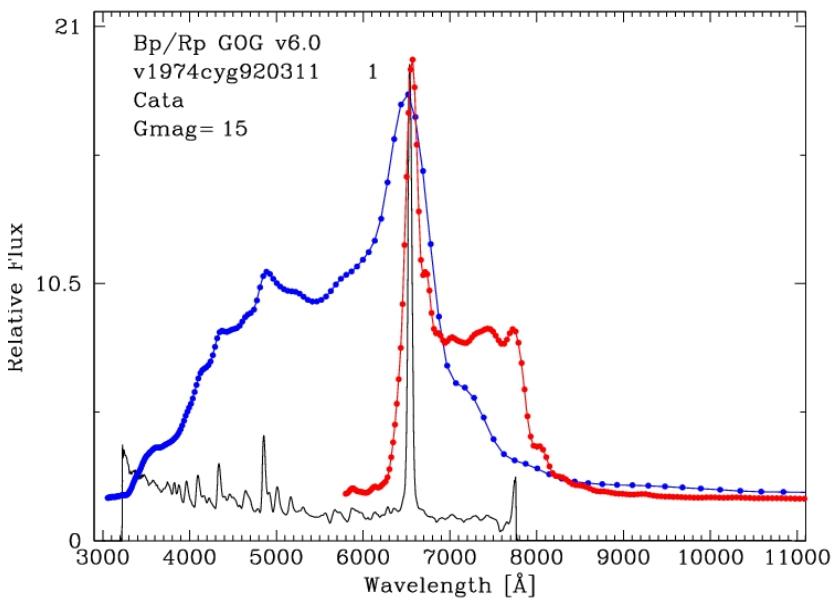
Clear relationships between various indexes provide important clues for developing robust em. line star classification algorithms



748 PNe spectra from MASH Catalog (H α survey of SGP)
vizier.u-strasbg.fr/vizier/MASH from 2-m class telescopes
 MSSSO 2.3m, SAAO 1.9m, ESO 1.5m, OHP 1.9m
 3790-7700 Å ; 5.9-7.2 Å FWHM



138 Wolf-Rayet WN & WC stars in SMC and LMC from Torres-Dodgen & Massey 1988, AJ 96, 1076; 3400-7300 Å, $\Delta\lambda \sim 10$ Å, Cerro-Tololo (CITO) 1.5m and 77 spectra of 7 galactic WR stars from HPOL Archive



52 active M dwarfs (dMe) from SDSS-DR5; West et al. 2008, AJ 135, 785
[SLOAN cas.sdss.org/astrodr5/en](http://SLOAN.cas.sdss.org/astrodr5/en) (database of ~61,000 M-star spectra)
 3800-9200 Å, R=1850-2200 (69 km/s pp), APO 2.5m

Conlcusions:

Data mining of on-line digital spectral catalogs and archives (Vizier, MAST, HPOL, SDSS5, OHP-Elodie).

1620 emission line star Bp/Rp spectra processed with GOGv6.0 for G=15 mag.

Pairs of H α , H β , H γ , He II, C IV, & [O III] indexes defined for GOG output spectra in emission line star class discrimination tests.

Strong emission line stars can be well separated but for weaker emission line stars RVS spectra are needed.

The near future:

Better Bp/Rp coverage from EFOSC (586 spectra of 99 peculiar stars); searching more on-line spectral catalogs & archives.

Testing of Neural network algorithms, decision tree analysis (Weka), fast segmentation algorithms using emission line index relations.