

# Variability of emission lines of large sample type 1 AGN from the SDSS-RM project

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**Astronomy  
&  
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## The intrinsic Baldwin effect in broad Balmer lines of six long-term monitored AGNs

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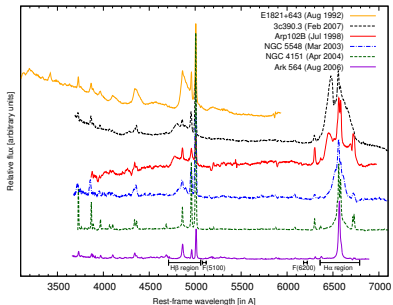
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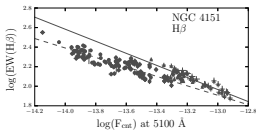
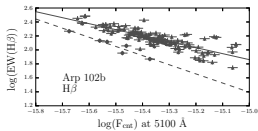
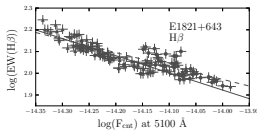
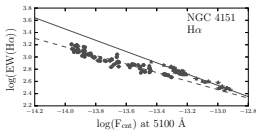
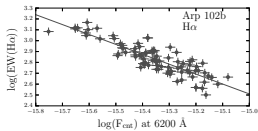
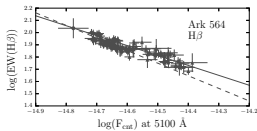
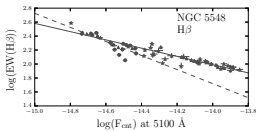
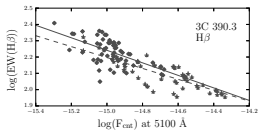
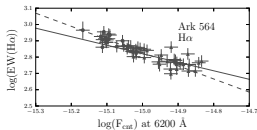
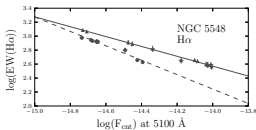
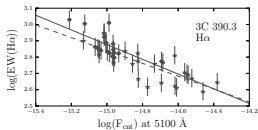
Received 18 November 2016 / Accepted 17 March 2017

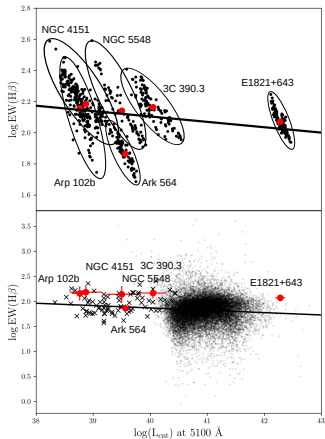
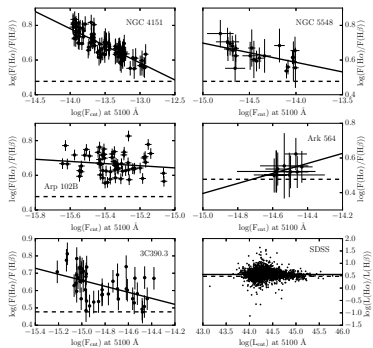
- ▶ Intrinsic Baldwin effect – anti-correlation between the EW of the emission line and the underlying continuum of individual variable AGNs (Pogge & Peterson 1992).

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- ▶ two Seyfert 1
- ▶ two AGNs with double-peaked broad line profiles
- ▶ one high-luminosity quasar with highly red asymmetric broad line profiles
- ▶ one narrow line Seyfert 1





- ▶ The intrinsic Beff is present in broad Balmer lines of six Type 1 AGNs studied in this paper.
- ▶ The shift and the change in the slope of the intrinsic Beff is observed in all the considered AGNs.
- ▶ Taking into account that the AGNs in the studied sample have different line shapes that indicate different BLR geometries, the intrinsic Beff is probably not caused by the geometry of the BLR. However, this should be tested on larger samples of different AGNs.

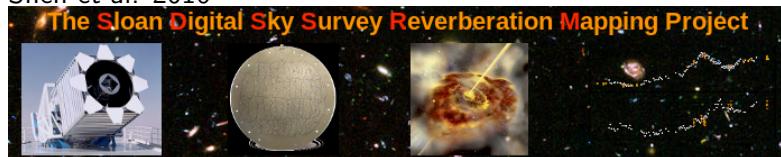
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Now we are trying to do that

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Shen et al. 2016



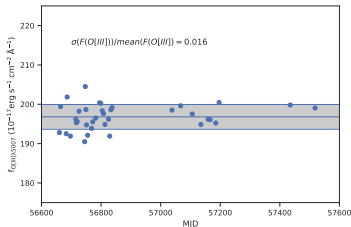
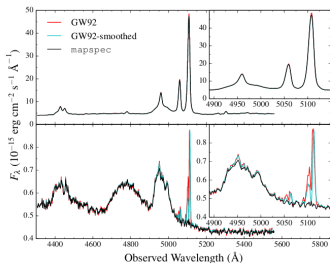
- ▶ We select  $\sim 100$  objects from the campaign
- ▶ 48 epochs per object spanned  $\sim 3$  yrs

# Internal calibration of spectra

- ▶ Correcting for night to night differences in observing conditions

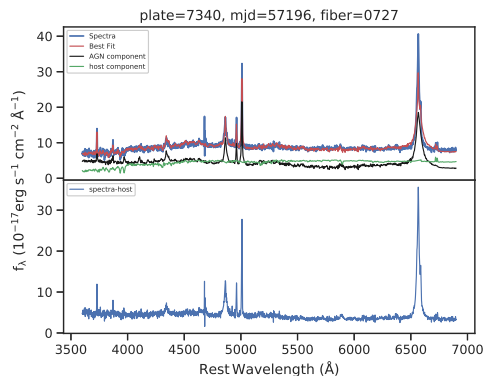
# Internal calibration of spectra

- ▶ Correcting for night to night differences in observing conditions
- ▶ Narrow [OIII] $\lambda$ 5007 line which is suppose to stay constant
- ▶ We adopt the Fausnaugh(2016) method. Check the python package called mapspec (MCMC Algorithm for Parameters of Spectra).

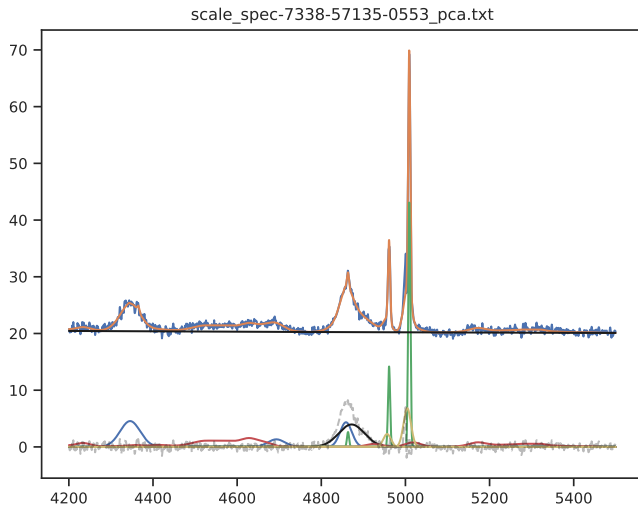


# Host galaxy decomposition

- ▶ Remove host galaxy contamination of spectra
- ▶ We are applying the Spectral Principal Component Analysis method (see Connolly et al. 1995; Yip et al. 2004; Vanden Berk et al. 2006)



# Fitting



http://servo.aob.rs/FeII\_AGN/

**Fe II (4000-5500 Å) template in AGN spectra**

Fit one spectrum   **Fit multiple spectra**

**spectrum (plain/text):**  No file selected.

Temperature (K):

Doppler width of Fe II lines (km/s):

The shift of Fe II lines (km/s):

Intensity of F Fe II group of lines:

Intensity of S Fe II group of lines:

Intensity of G Fe II group of lines:

Intensity of P Fe II group of lines:

Intensity of I Zw 1 Fe II group of lines:

Number of iterations:

**Instructions:**

Upload the AGN spectrum within 4000-5500 Å range, with subtracted continuum. Make spectrum to be two column ascii file (wavelength, flux) of "plain/text" mime type, regardless of extension. Put initial parameters in the form. For approximate temperature, width and shift you may use the values given in the **Test** (down), but for intensities put the values which are approximately the same order of

**Fe II lines Theory**

[Optical Fe II lines in AGN spectra](#)

[The Fe II template](#)

[References](#)

**Fit Fe II lines**

[Fit one spectrum](#)

[Fit multiple spectra](#)

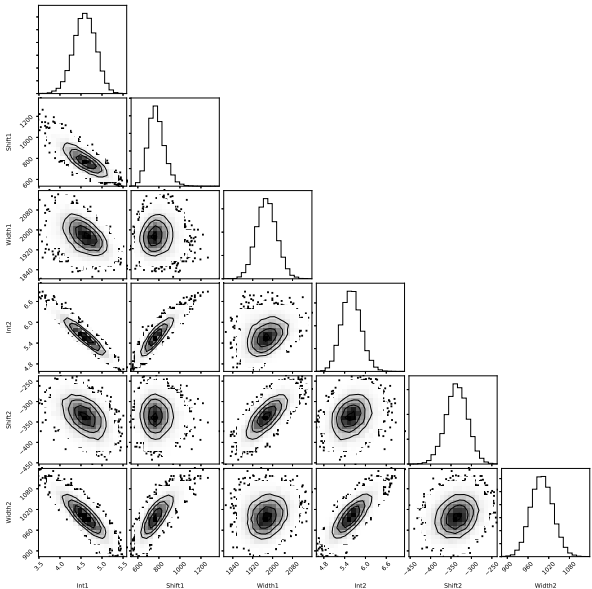
[Optical Fell template - download](#)

[UV Fell template - download](#)

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[Vojko Yujic](mailto:Vojko.Yujic@pmf.unibl.org)

Kovačević+(2010) and Shapovalova+(2012)

# MCMC





# Main sequence

