The M_{BH}-M_{Bulge} relation for low-z AGN: preliminary analysis of a sample from SDSS-DR4 data

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Estimating black hole masses

- Dynamical measurement
- BLR line widths plus region size
  - reverberation mapping
  - M_{BH} - L_{rad} relation
- X-ray Fe line
- M_{BH} - σ relation
  - direct measurement
  - through fundamental plane

THE AIM

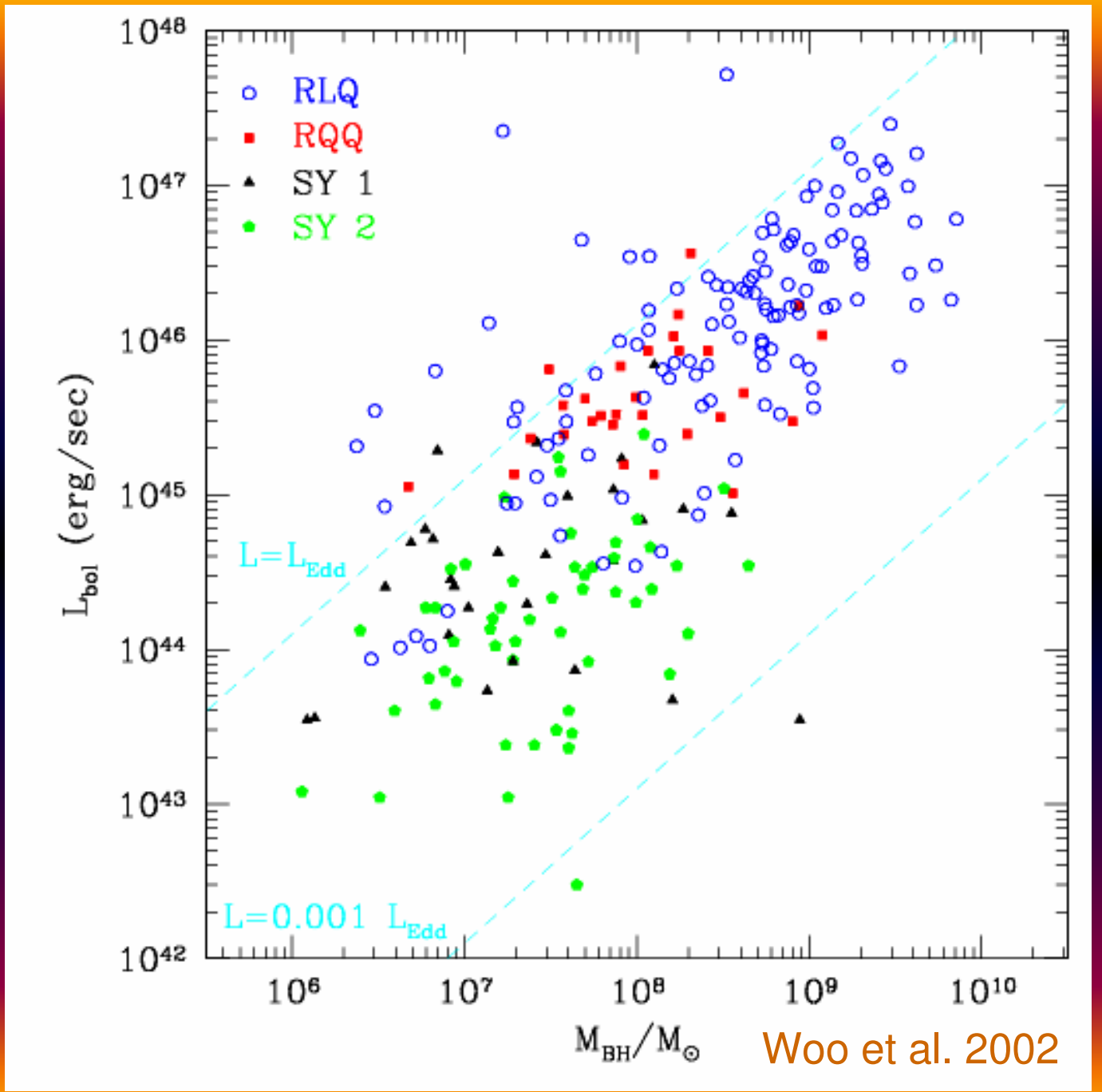
Investigate the Black Hole mass distribution of a large and homogeneous datasets of low-redshift AGN.

We plan to use L_{5000} and H_β to derive M_{BH}

We will try to answer the following question: Can we use SDSS images to measure M_{Bulge} for AGN? And derive M_{BH} from M_{Bulge}?

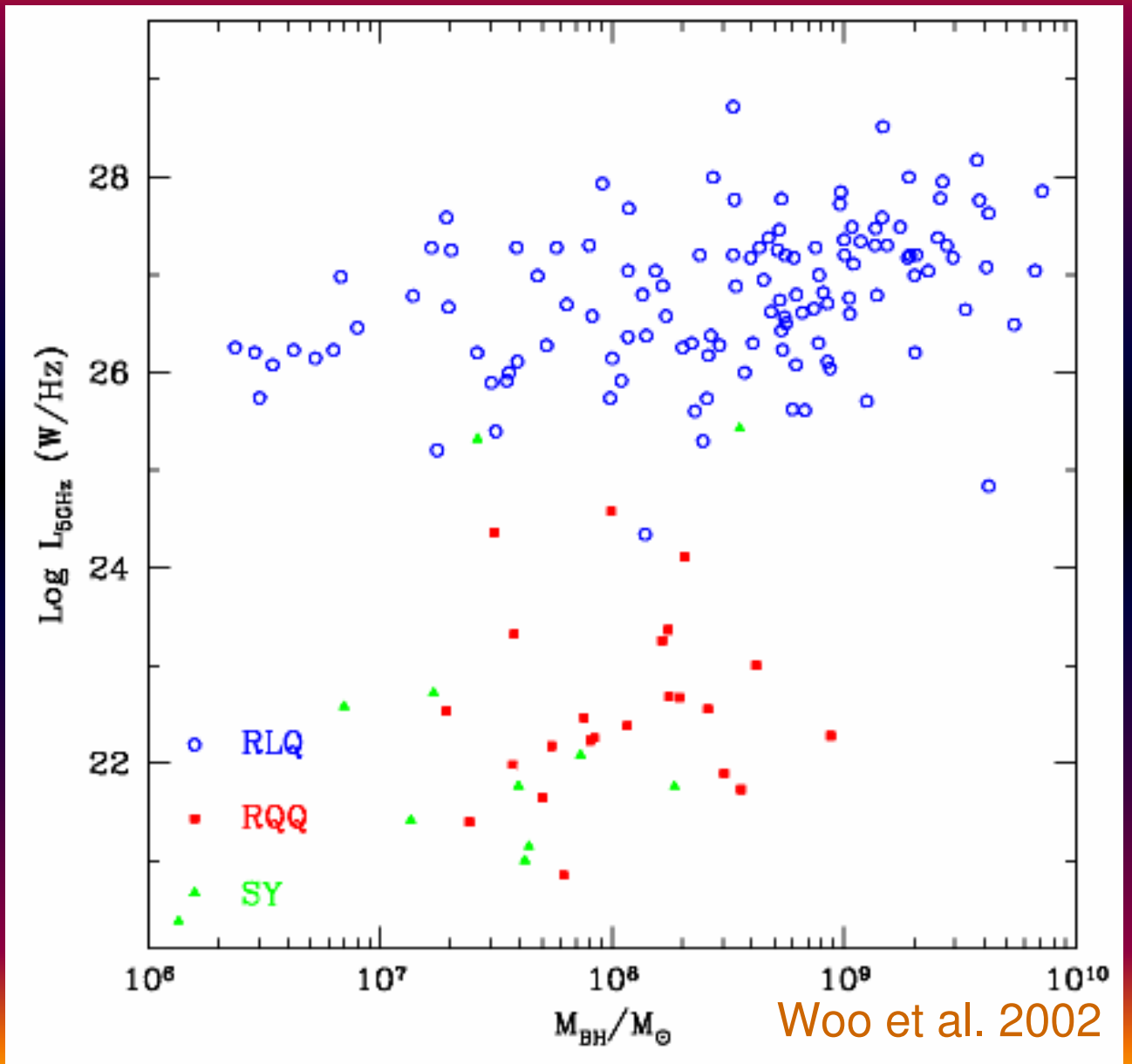
400 AGN black hole masses

- Collected ~200 from literature
- Estimated ~200 using host galaxy properties
- Measured bolometric luminosities from SEDs



Woo et al. 2002

Radio luminosity vs. M_{BH}



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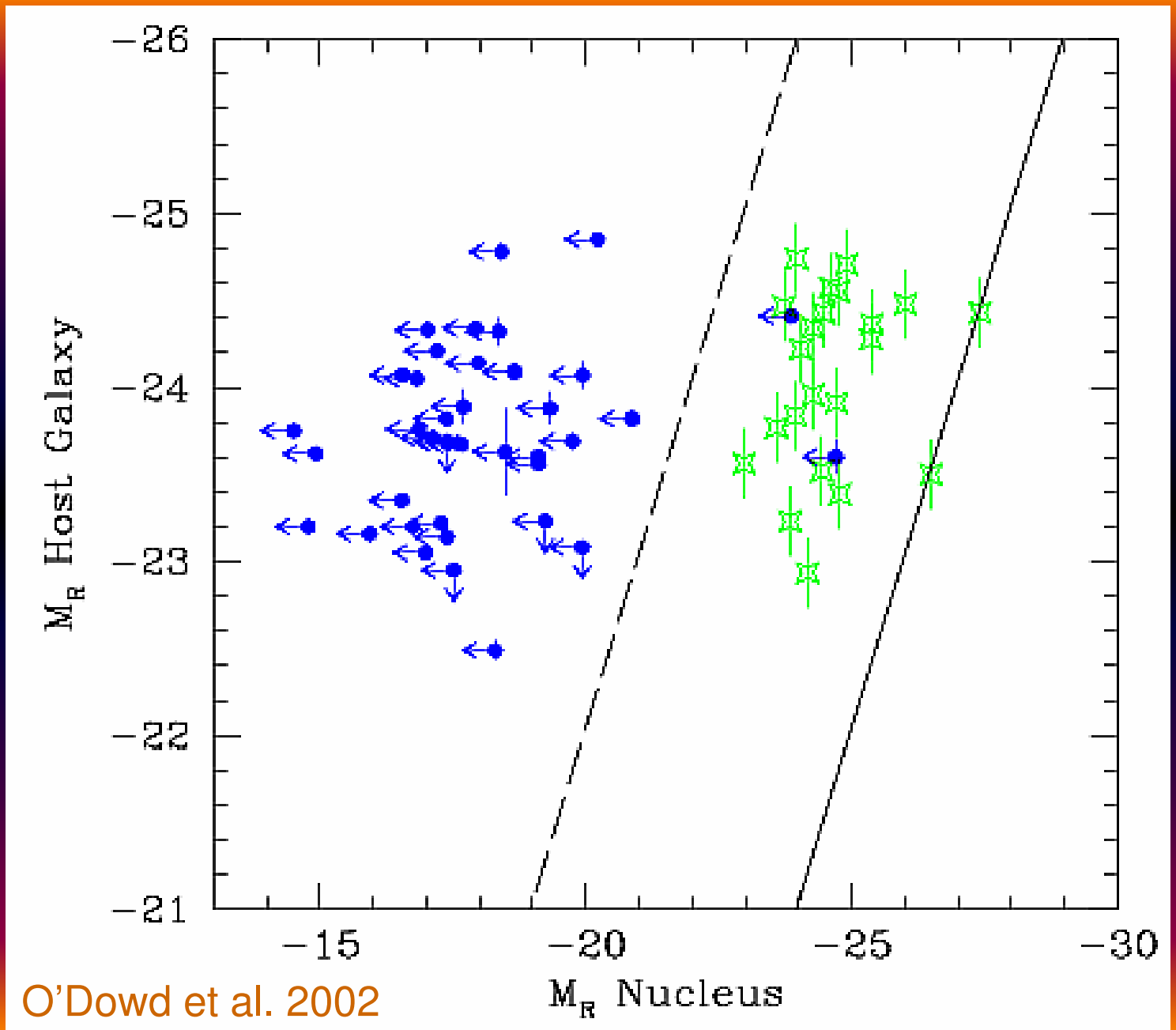
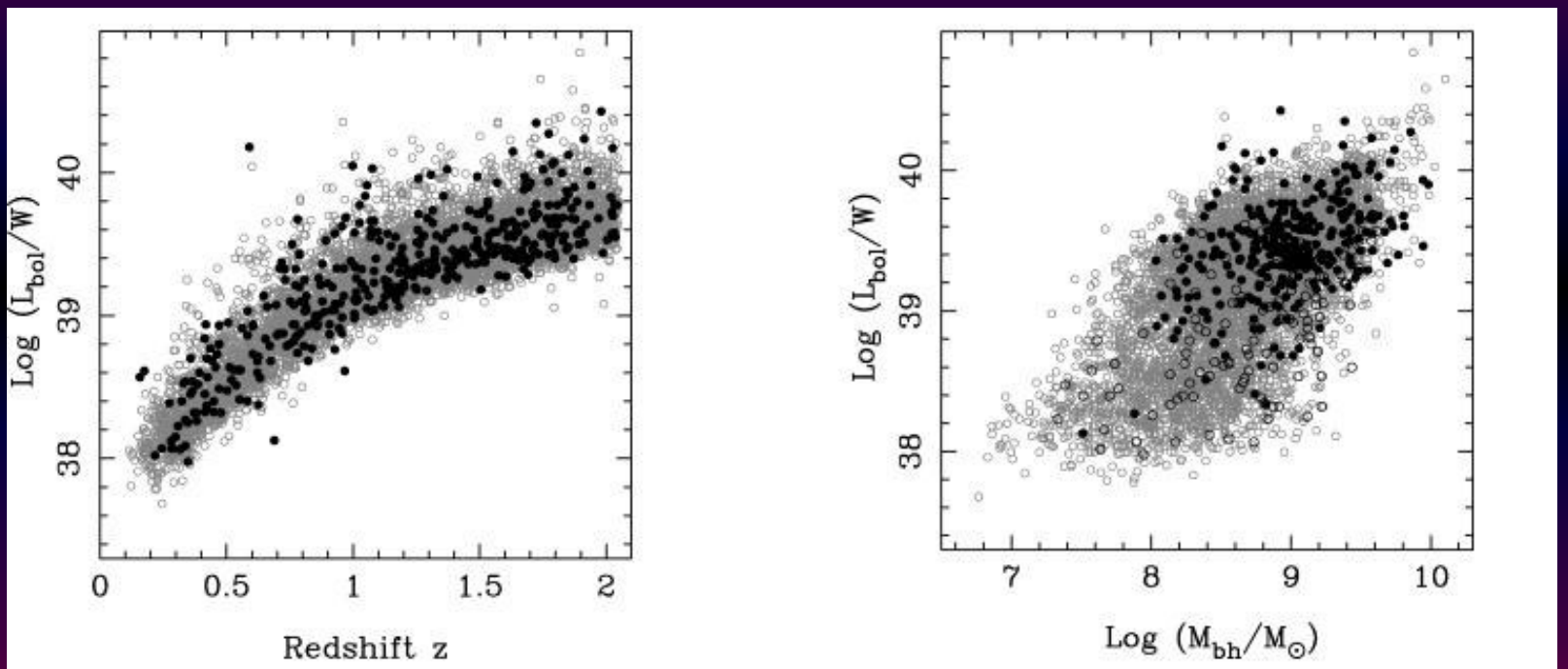


O'Dowd et al. 2002

The M_{BH}-M_{Bulge} relation for low-z AGN



McLure and Jarvis 2004

The M_{BH}-M_{Bulge} relation for low-z AGN

The Sloan sample

Redshift range : $0.01<z<0.3$

fracdeV_r > 0.8

Sloan flag “QSO” or “High-z QSO”

EW H_β > 5

EW OIII > 0

The M_{BH}-M_{Bulge} relation for low-z AGN

Two steps:

Measure the spectra and derive L_{5000} and FWHM of H_β

Analyse the images using GALFIT in order to separate the Bulge luminosity from the luminosity of the central Point Source

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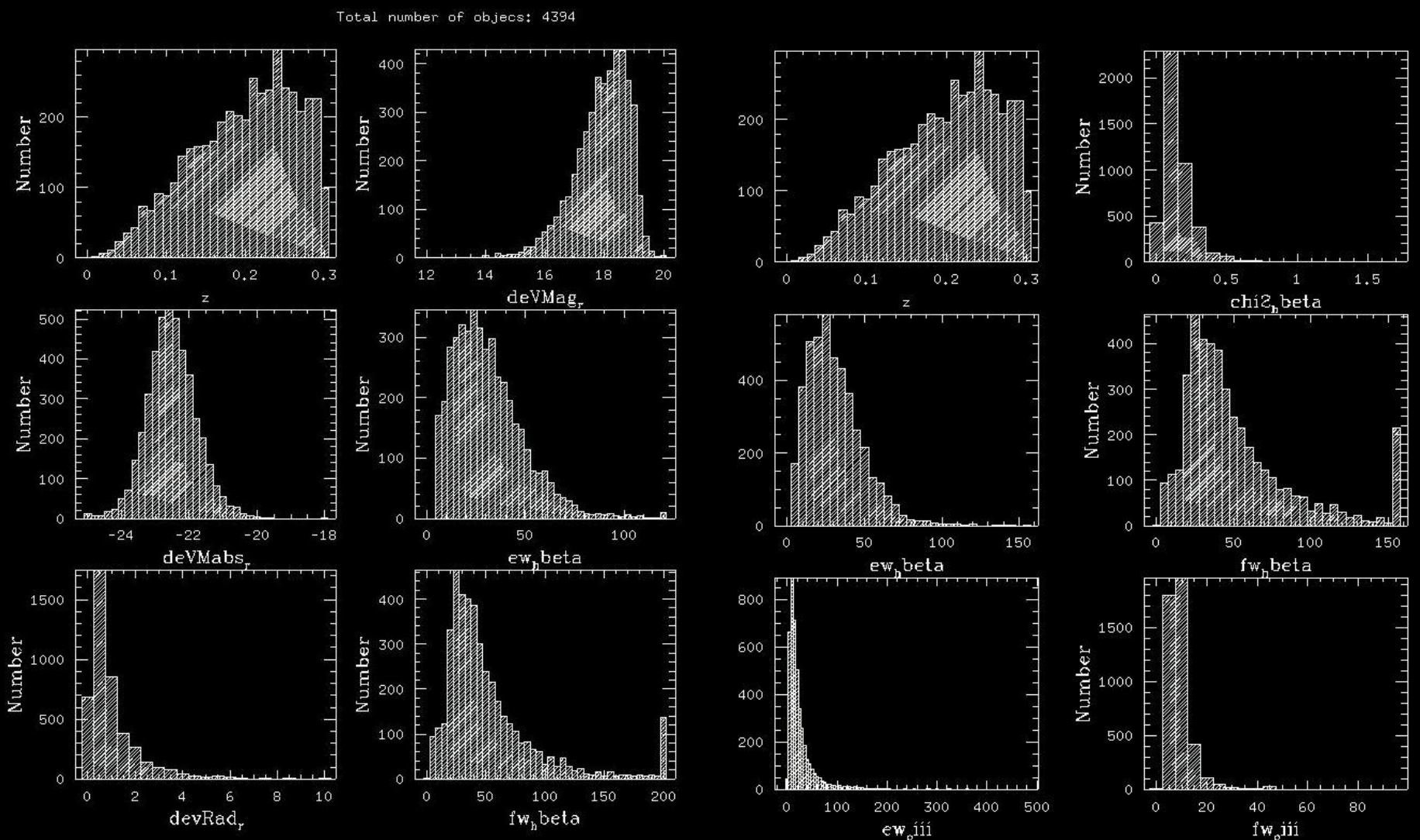

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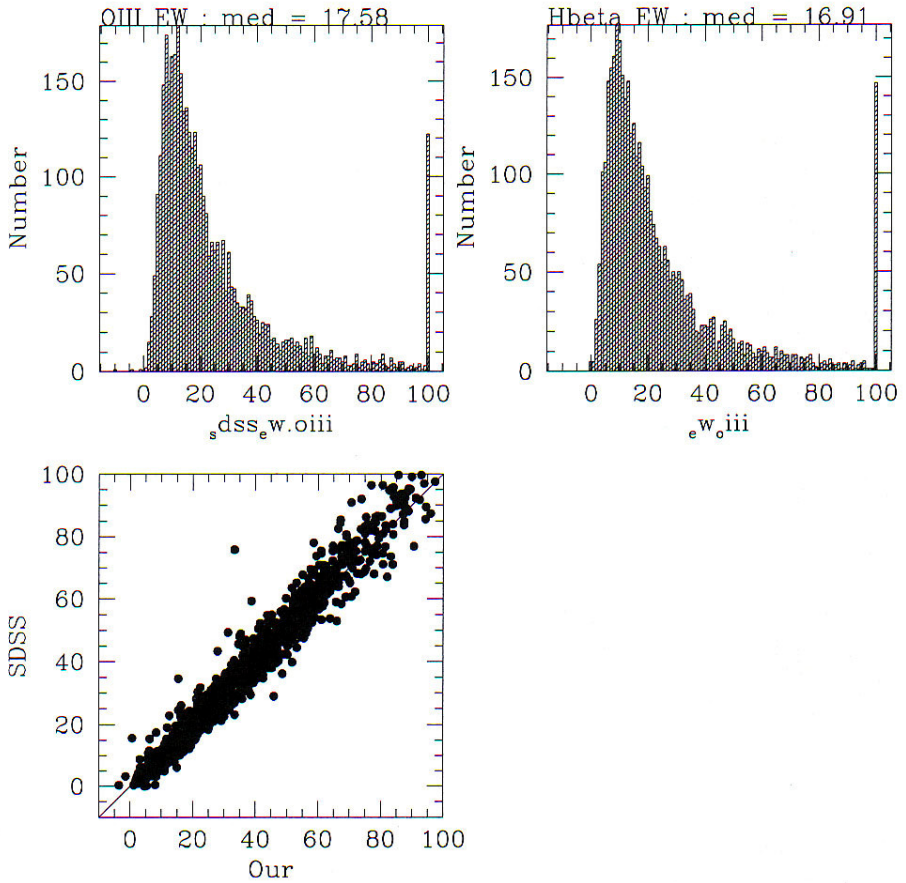

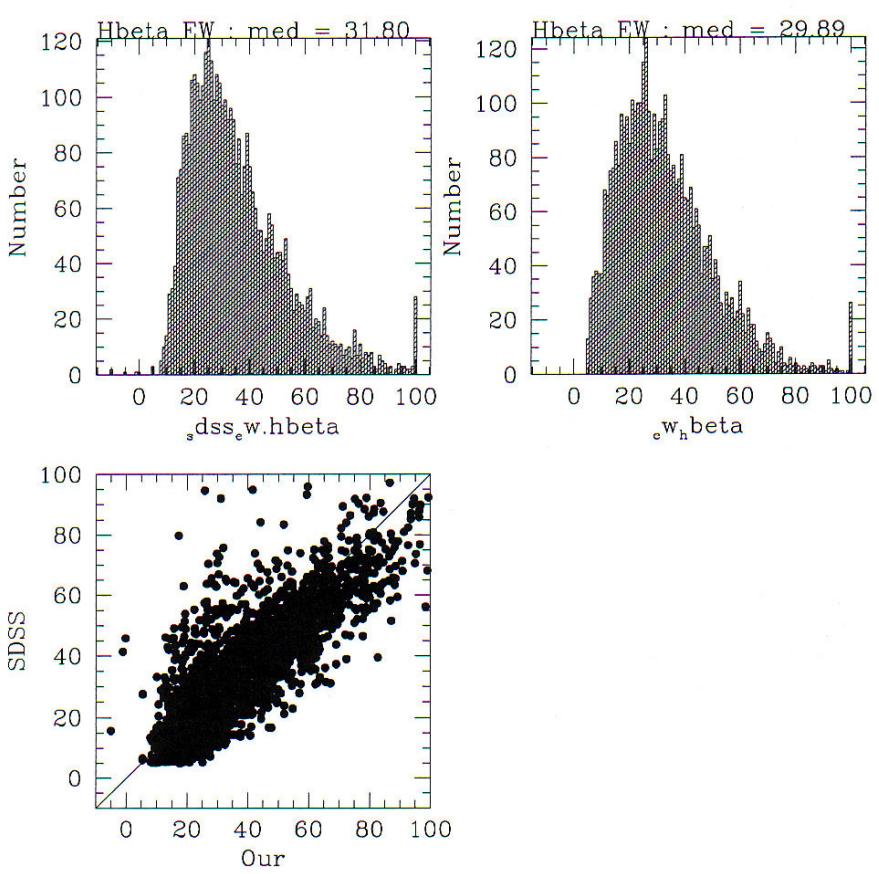

EqW OIII

EqW H_β

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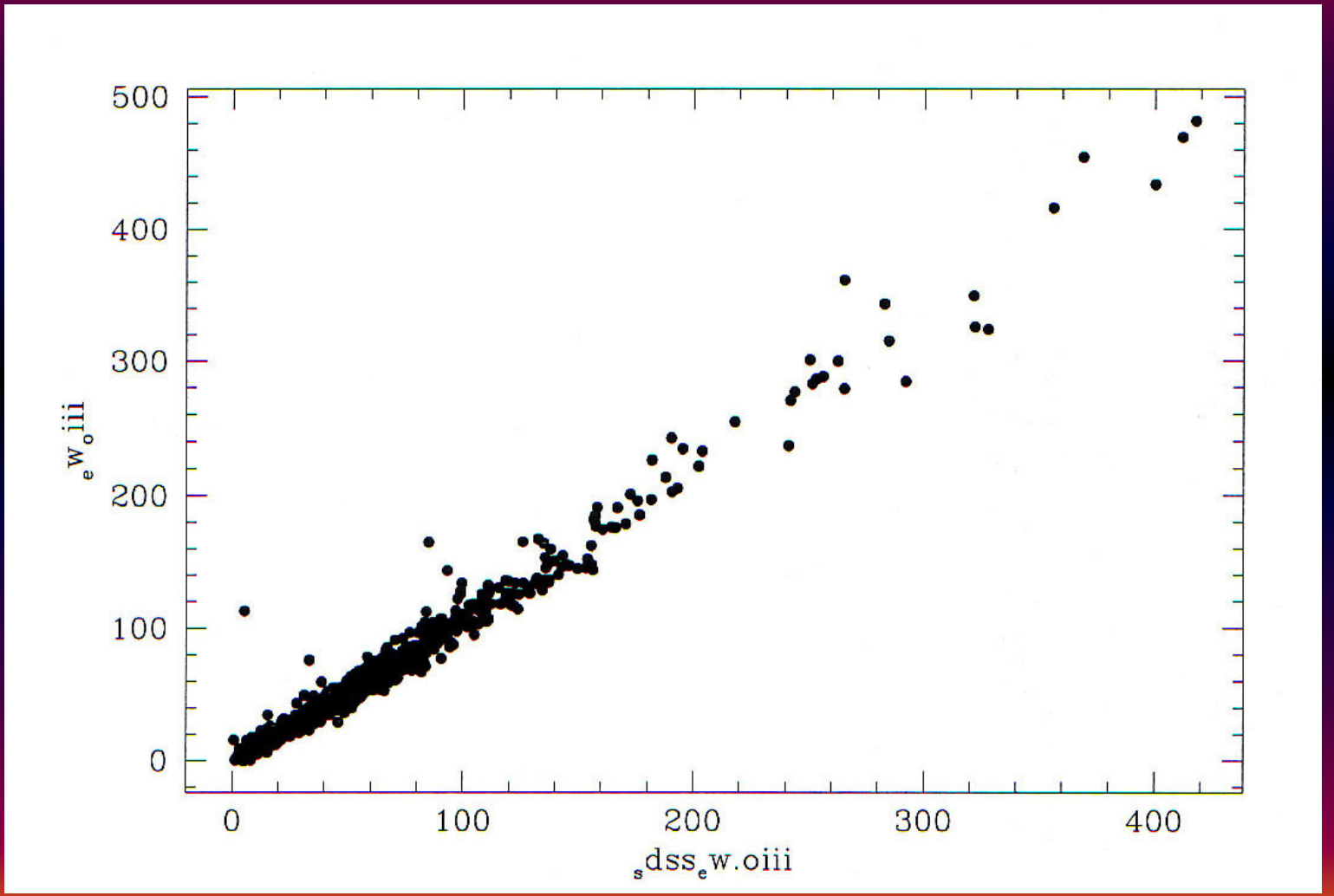

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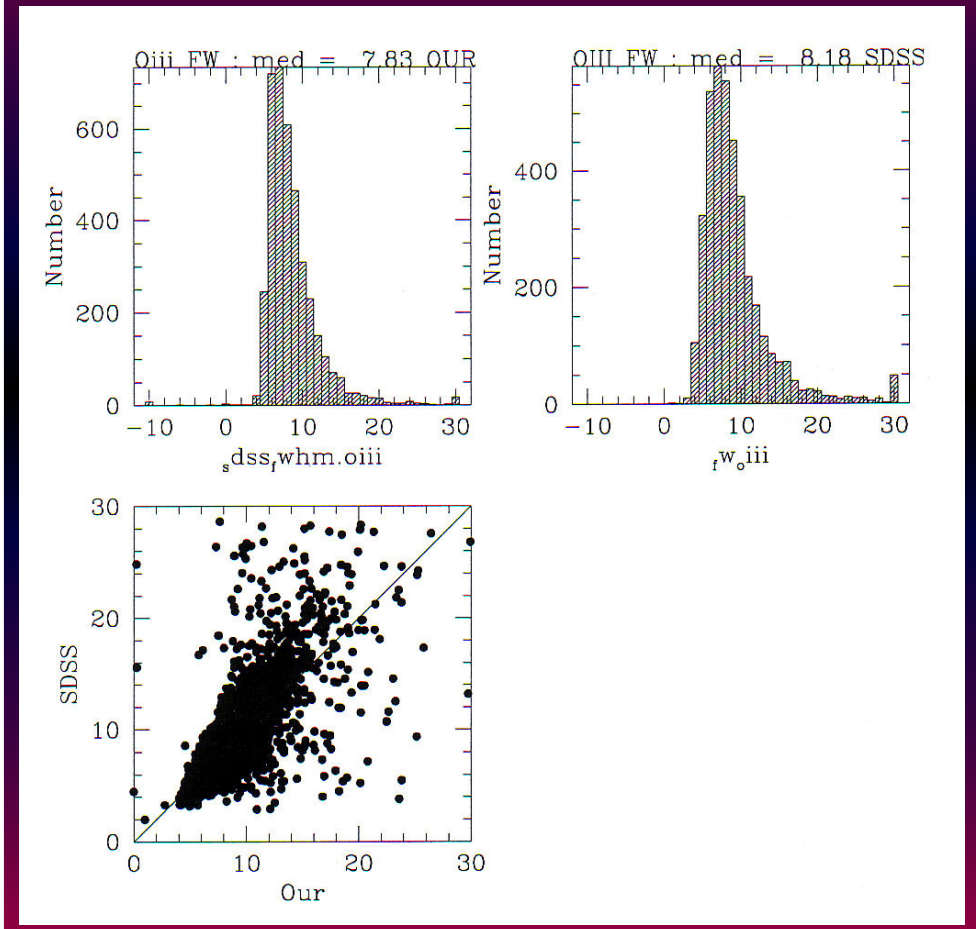
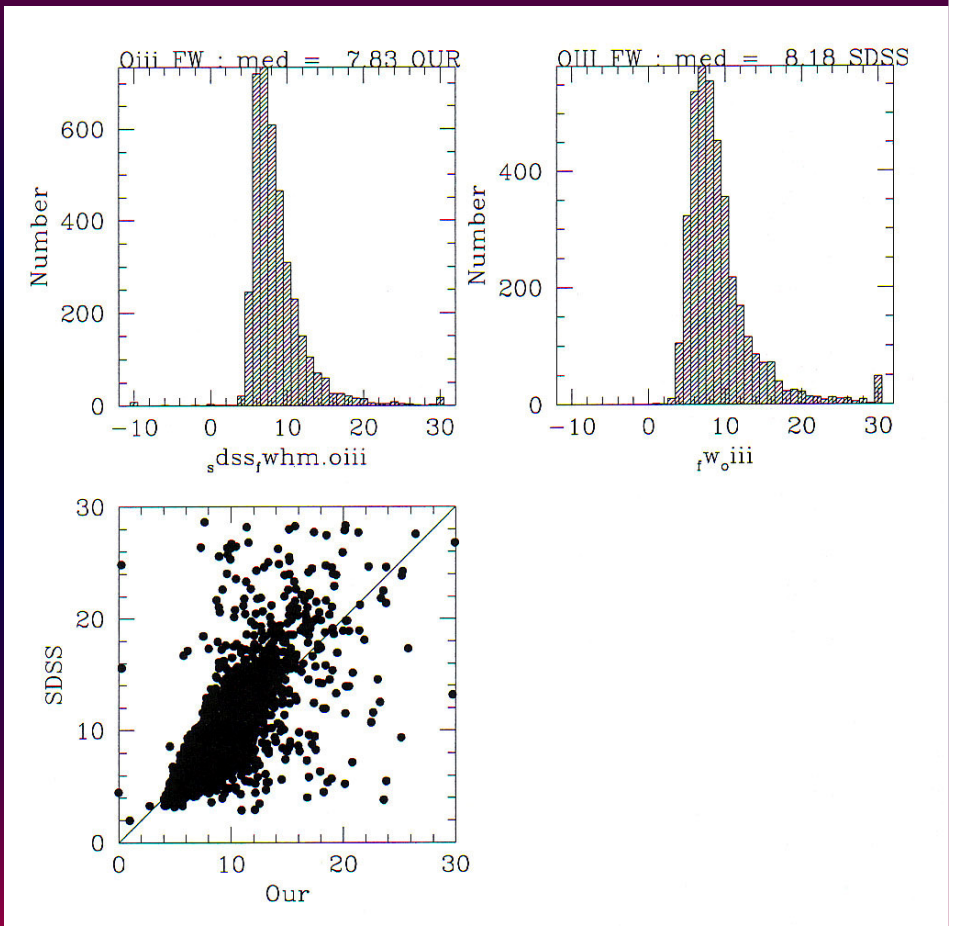


FWHM OIII



FWHM H_β

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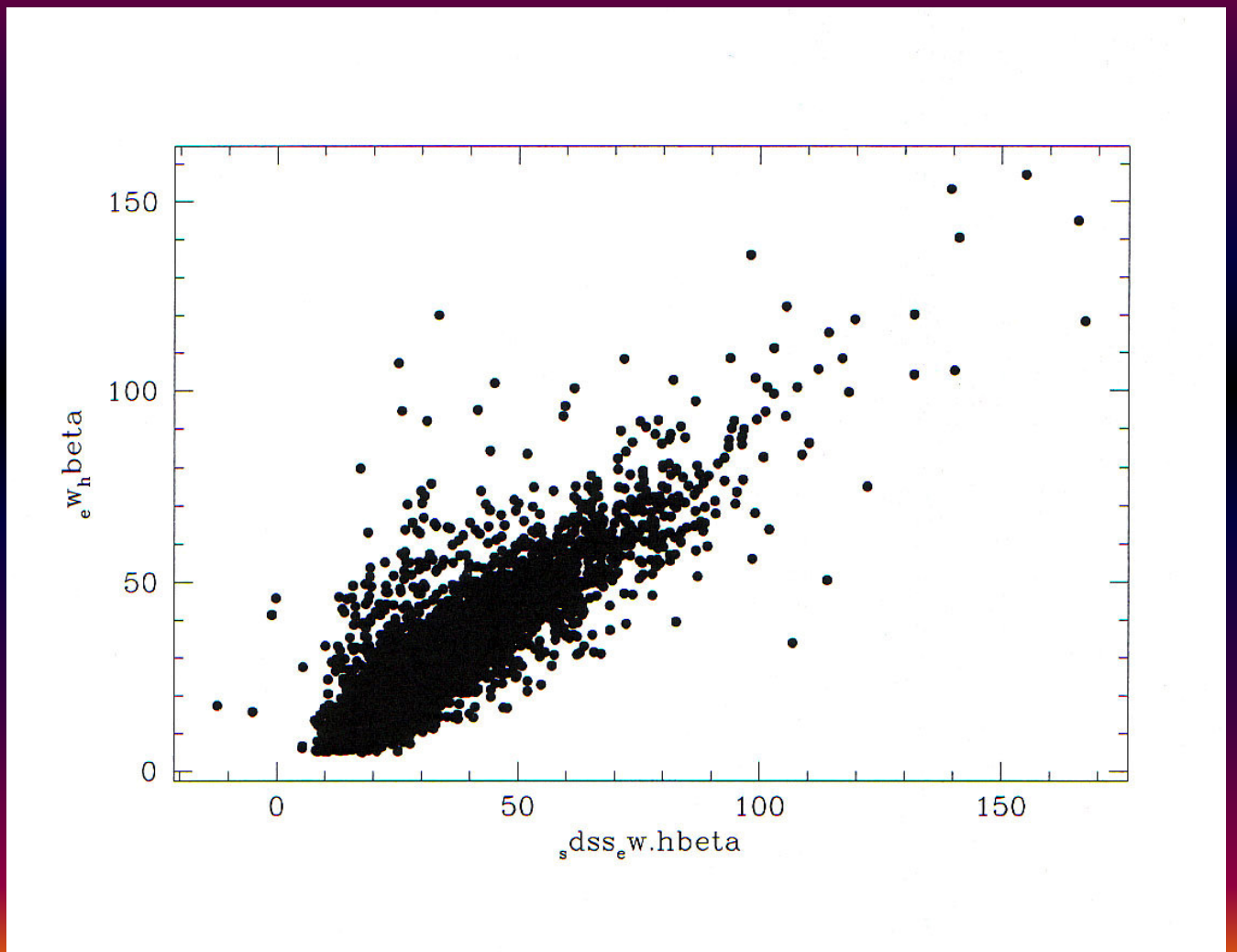

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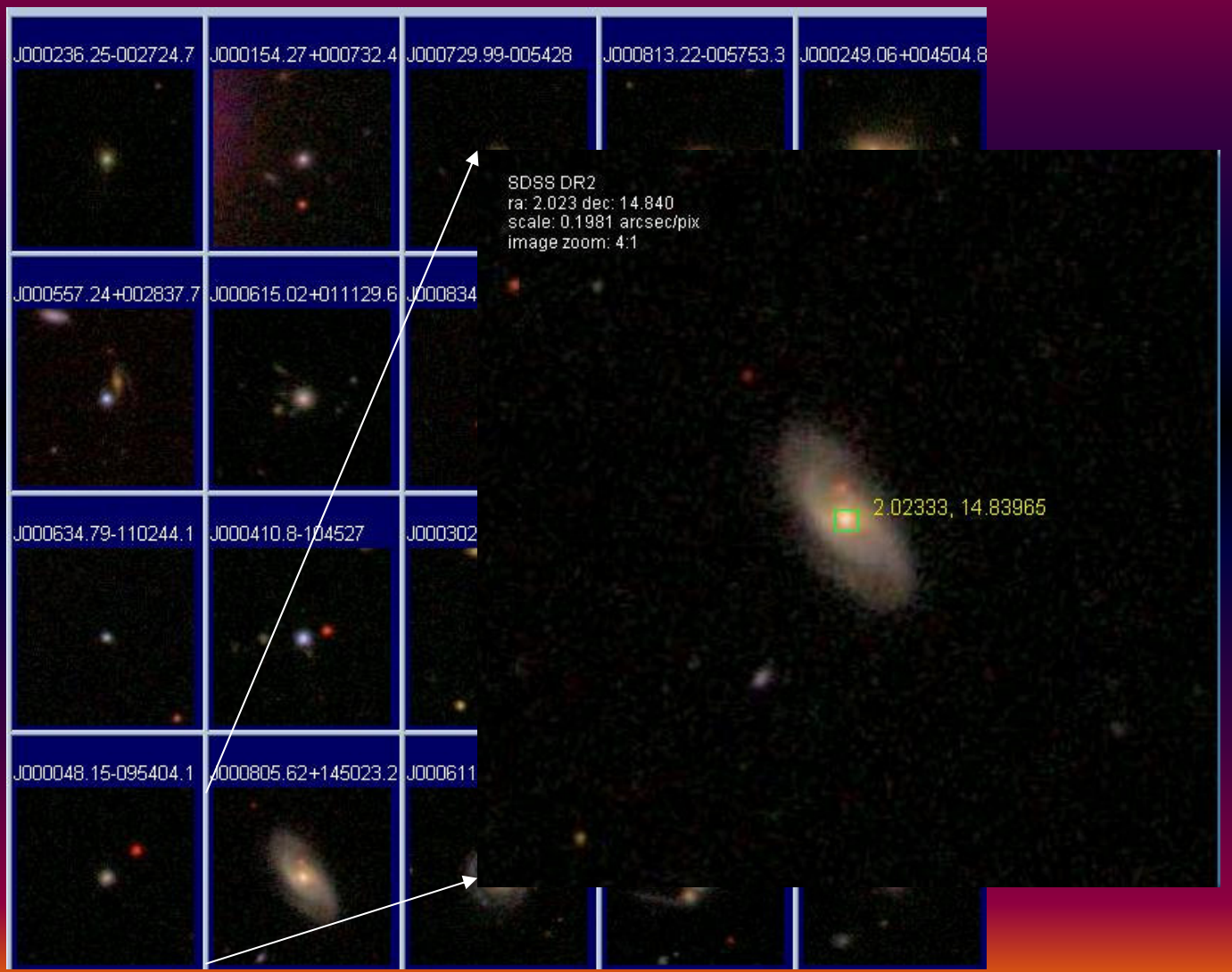

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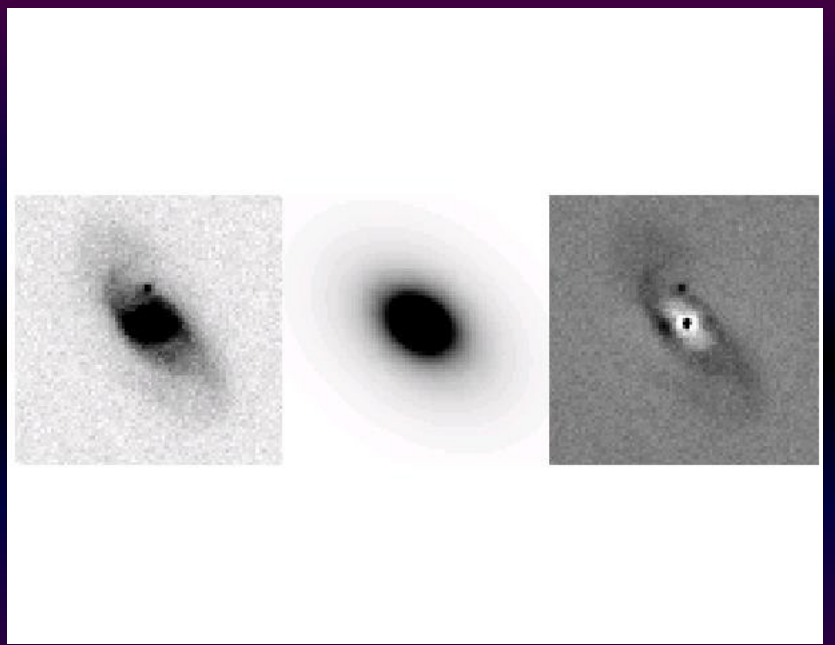
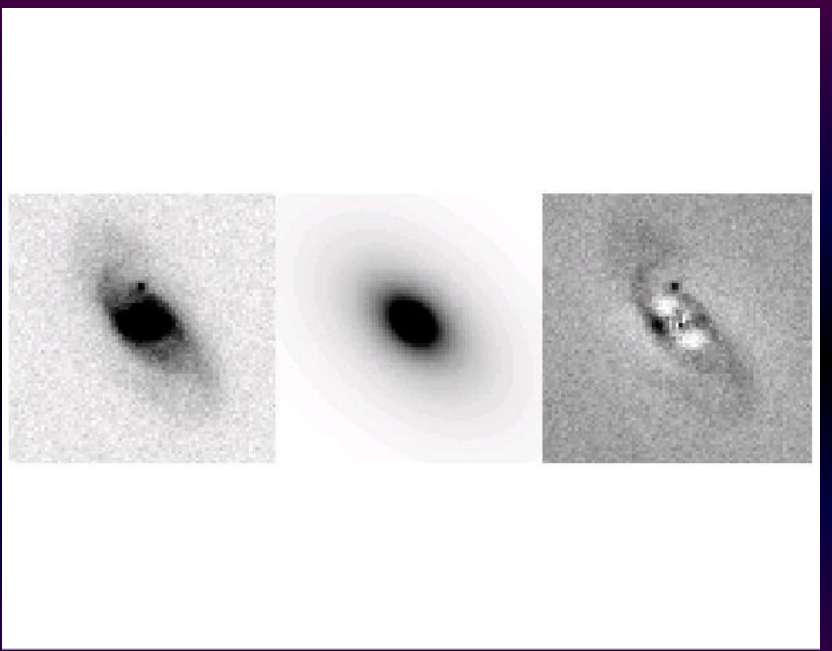


Fit: $R^{1/4}$ + PSF



Fit: $R^{1/4}$+ PSF+Point source

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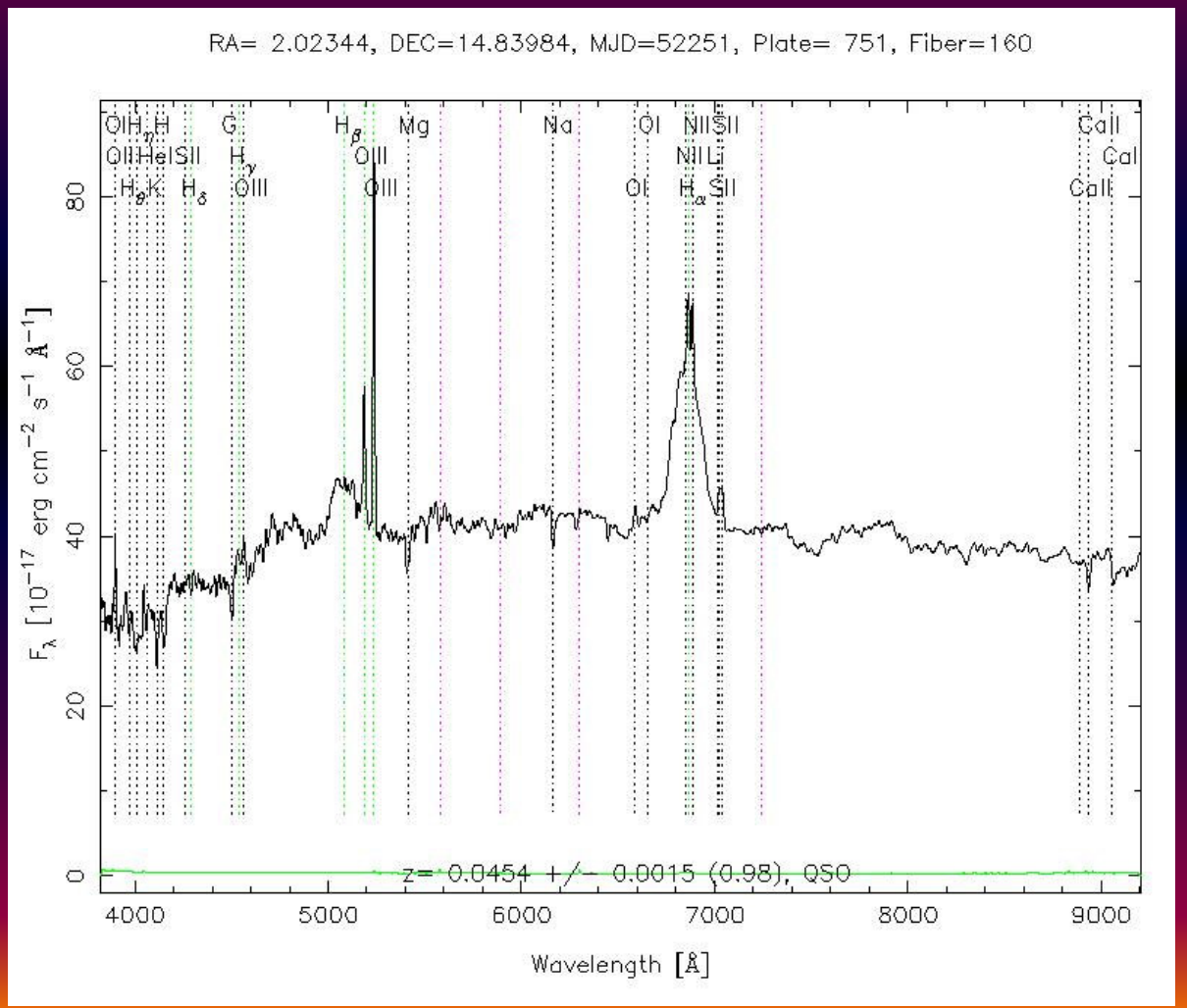

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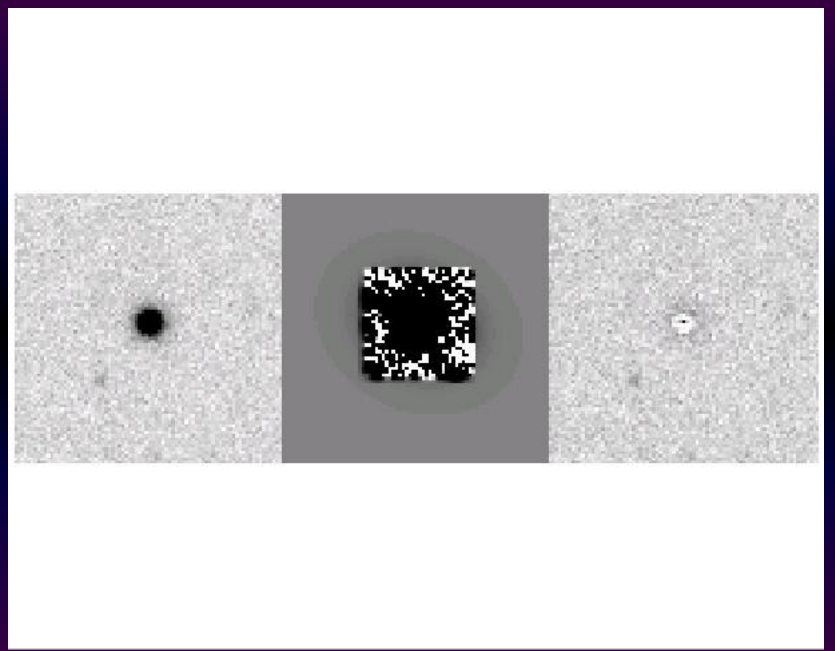

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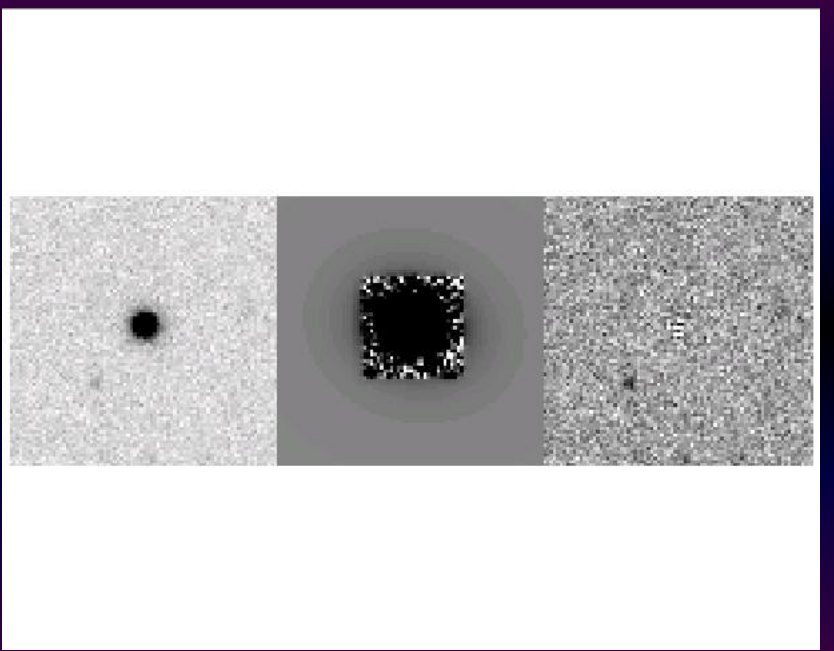

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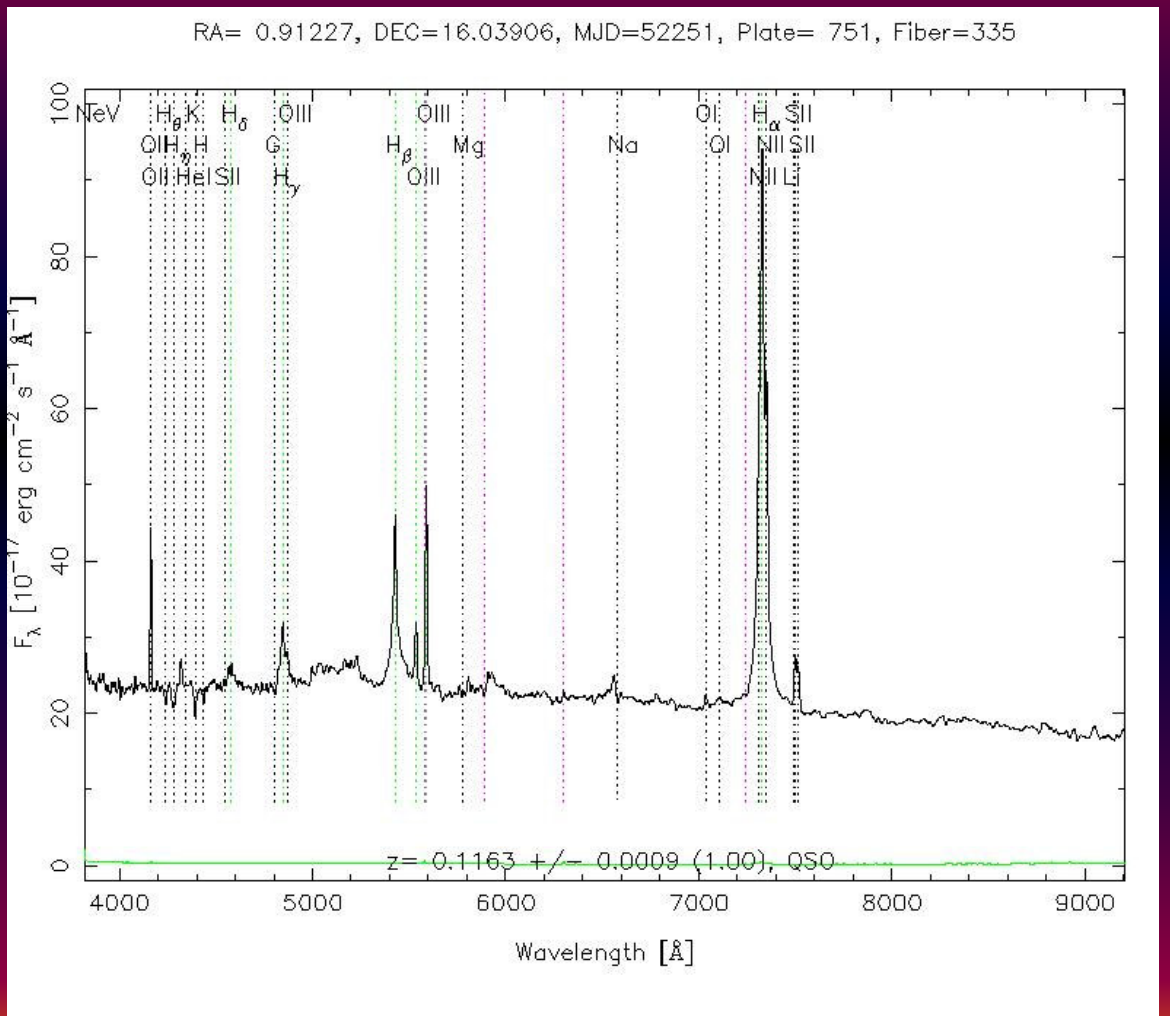

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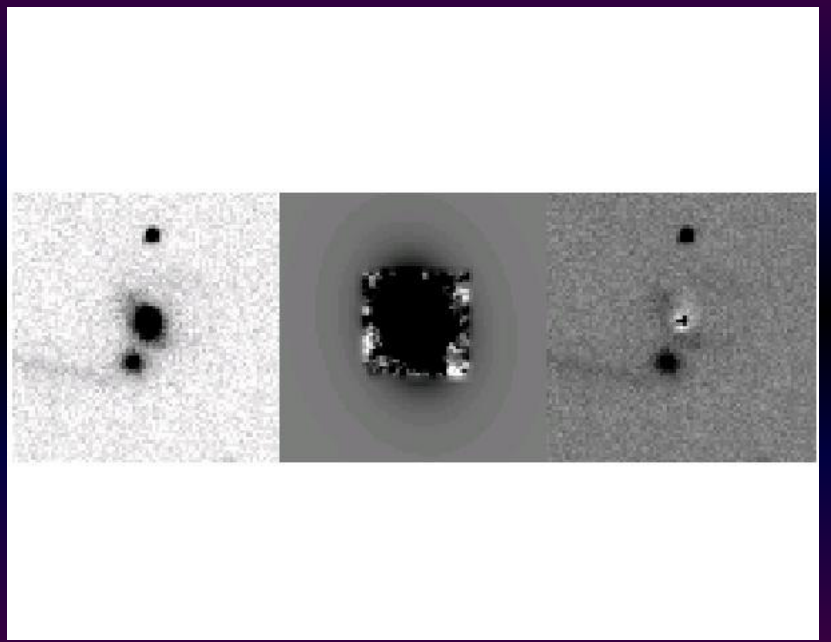

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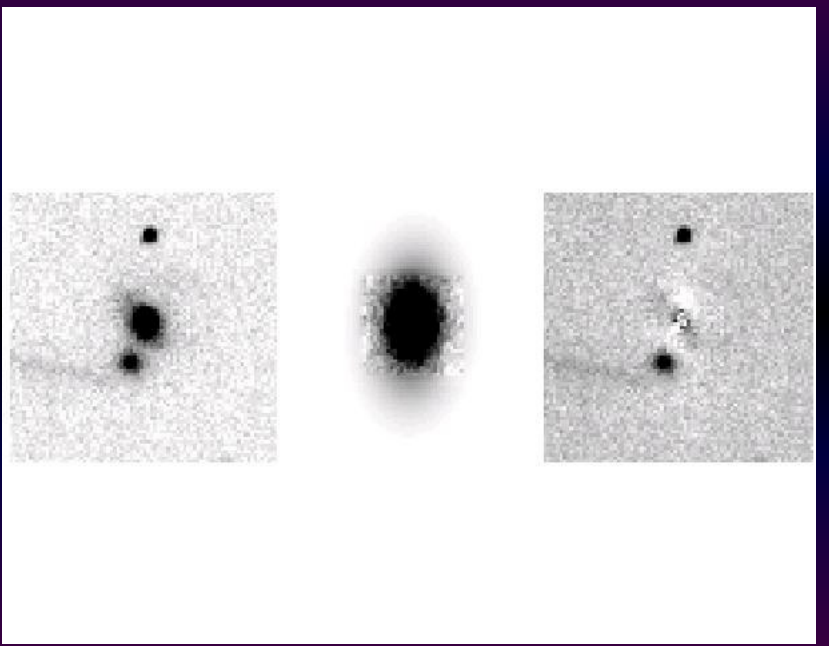

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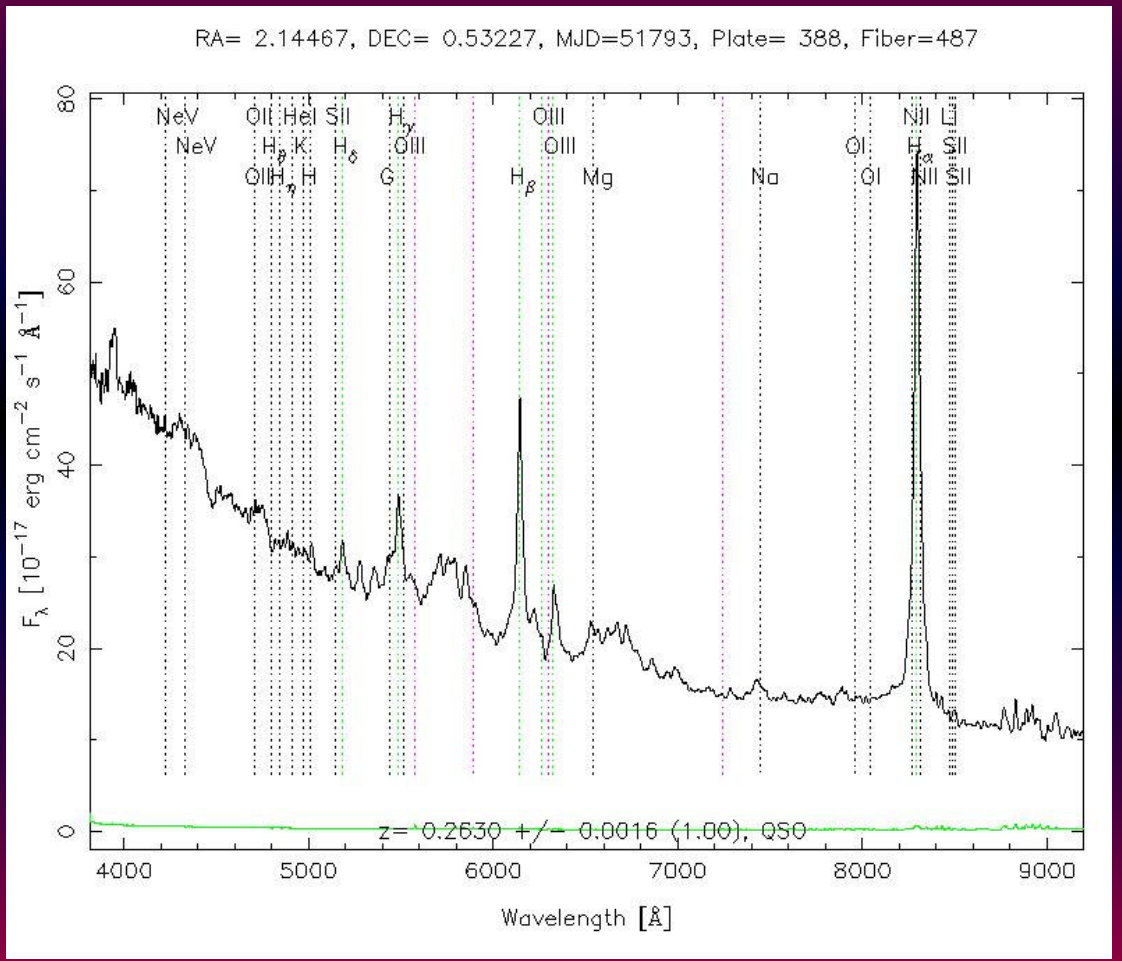

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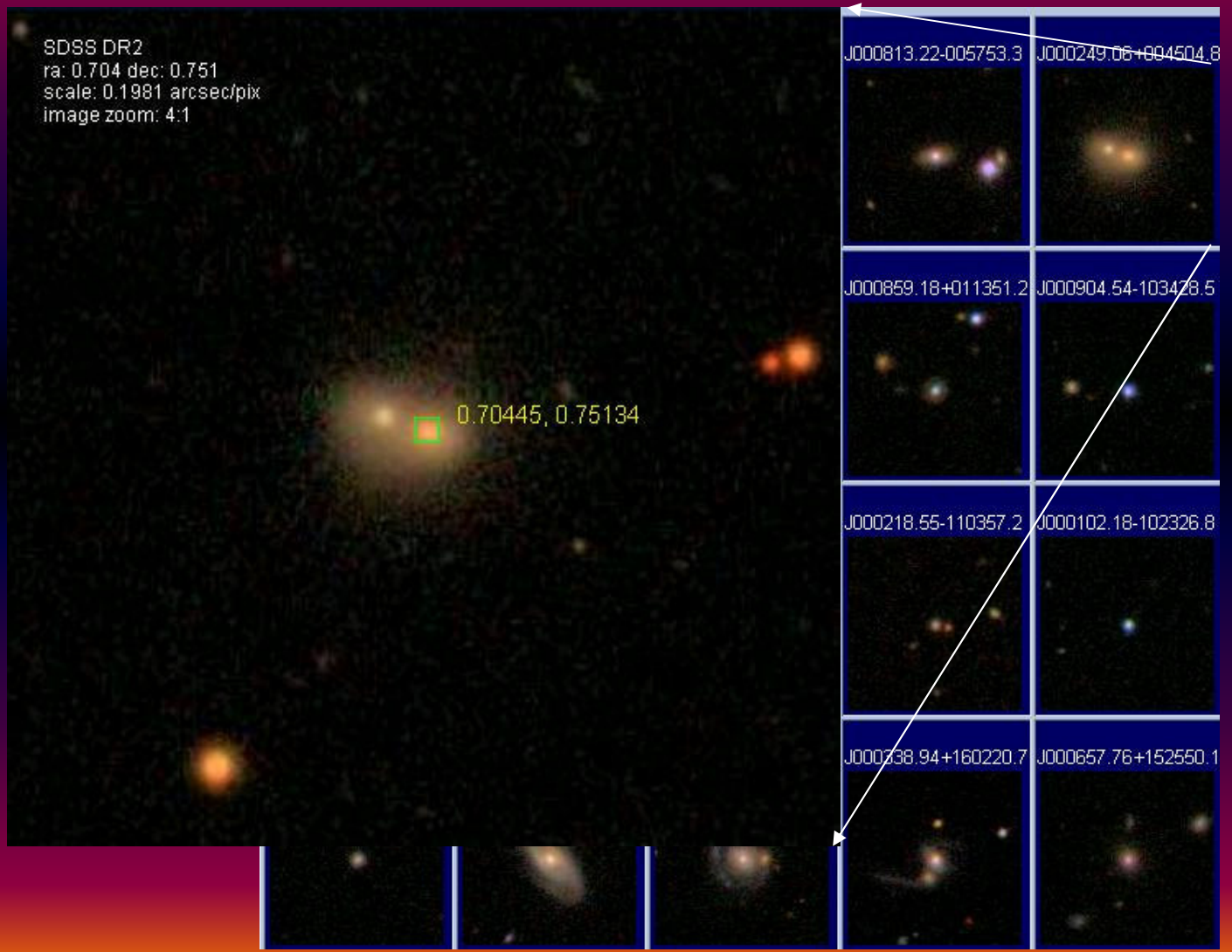

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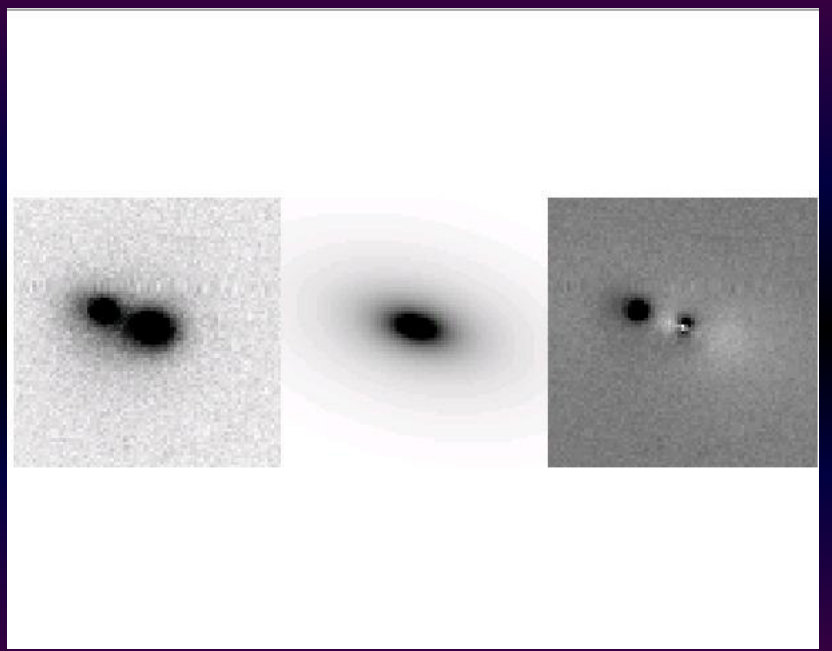

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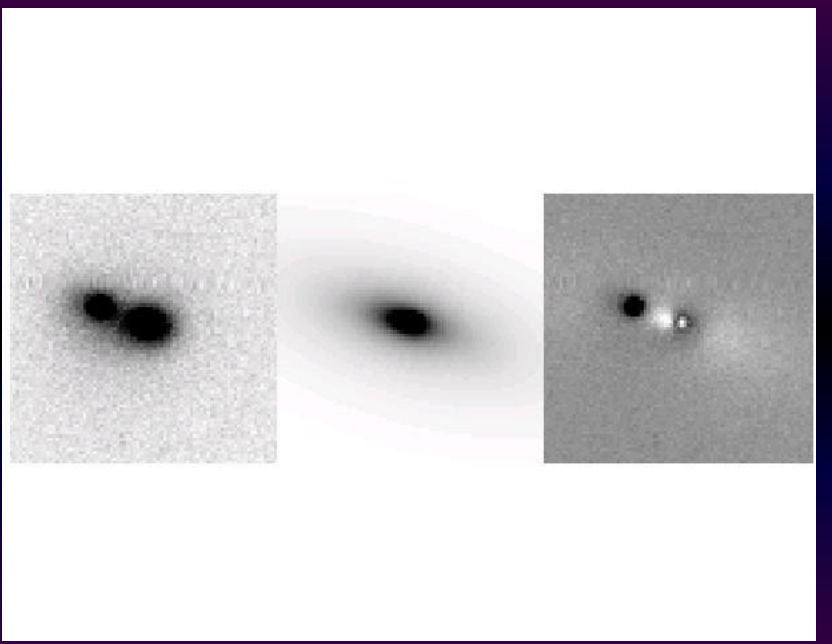

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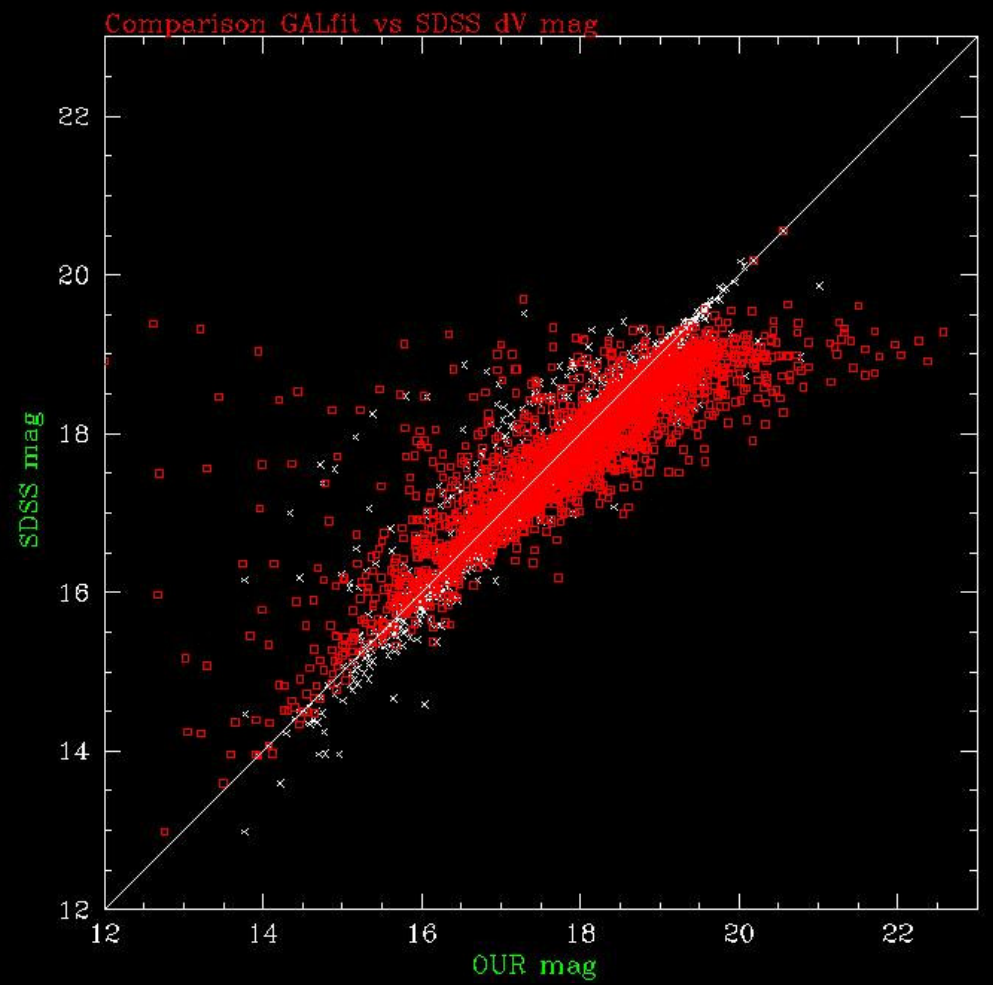

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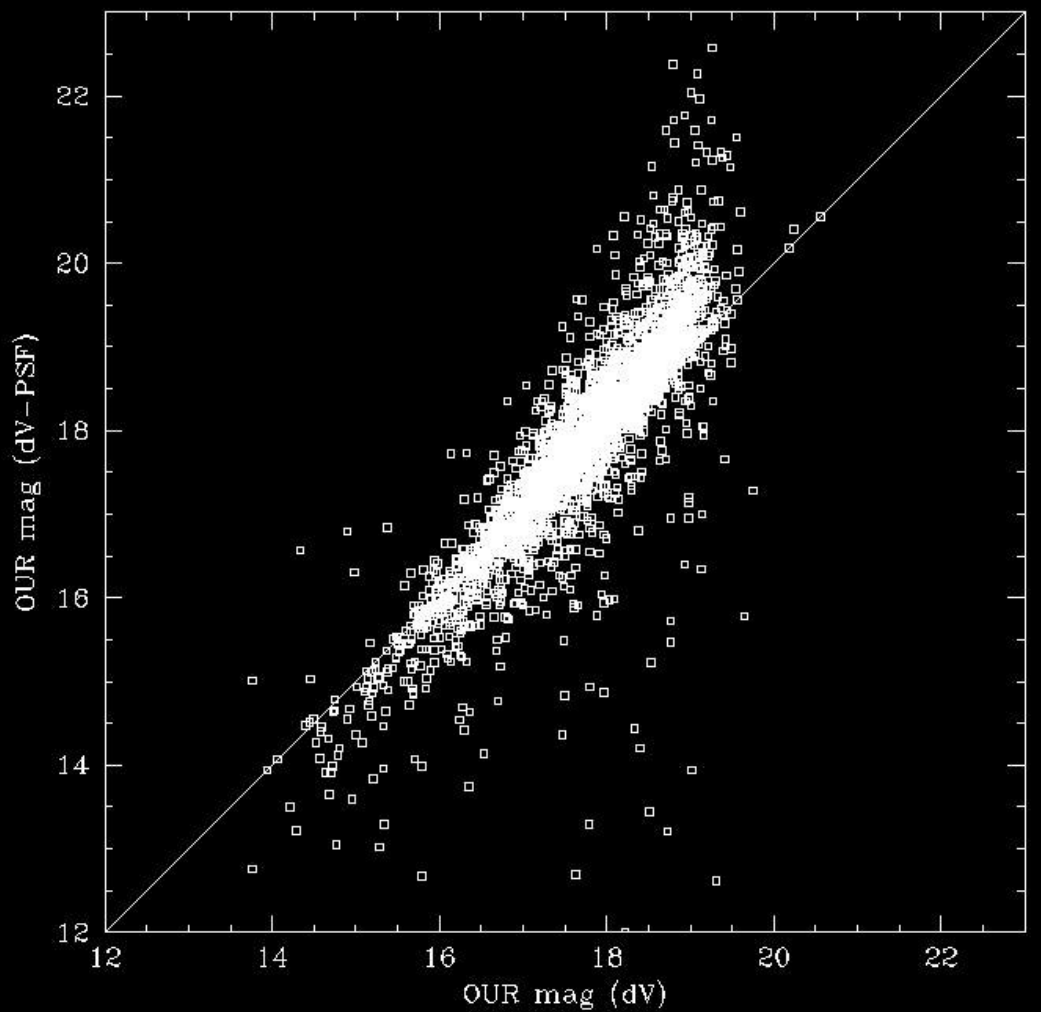

The M_{BH}-M_{Bulge} relation for low-z AGN

Results

We have to check the L_{5000} and H_β data to correct for stellar continuum

YES: Using GALFIT we can derive the bulge magnitude in AGN untill z~ 0.25-0.3

Using GALFIT we can also measure the effective radius (r_e) of the true bulge component and derive the Kormendy relation for these AGN