AGN, BLR

- Kenyon, Martinez-Aldama, Suvendu

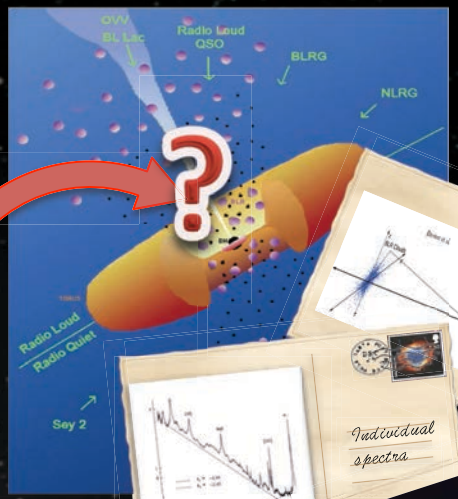
BSc (Earth Sci., Math. Phys.)
DipMus (Prac.), DipArts (Crim.)

Clare Kenyon

PGCE
MA (Education)

MSc (Astron.)

PhD (Astrophysics)
Supervisor: Rachel Webster



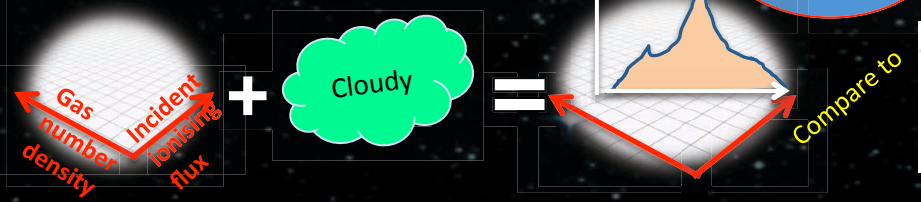
Probing the BELR through flux ratios

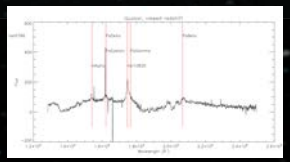
Line	λ
Lyα	1216 Å
Hα	6563 Å
Hβ	4861 Å
HY	4341 Å
Pa α	1.876 μ
Pa β	1.282μ
Pa ϒ	1.094μ
Pa δ	1.005μ
Pa ε	9549 Å
Br ϒ	2.166 μ
He I	5876 Å
He I	1.083 μ
He I	2.058 μ
He II	1640 Å
He II	4686 Å
He II	1.012 μ

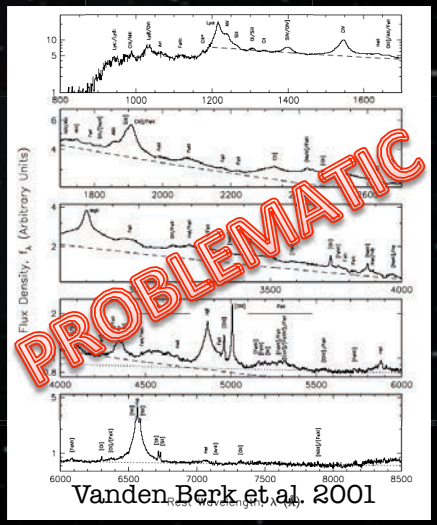
? Incident ionising flux

? Density of gas in emitting region

? Ionisation state of emitting gas





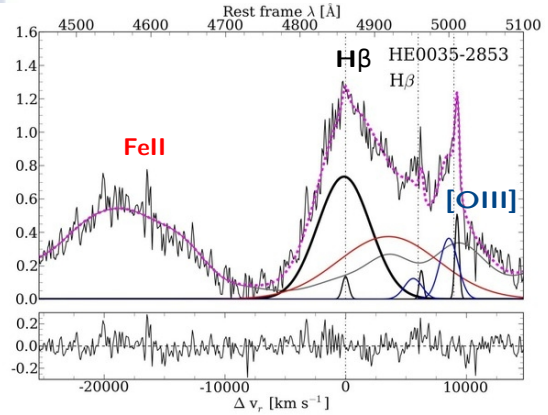


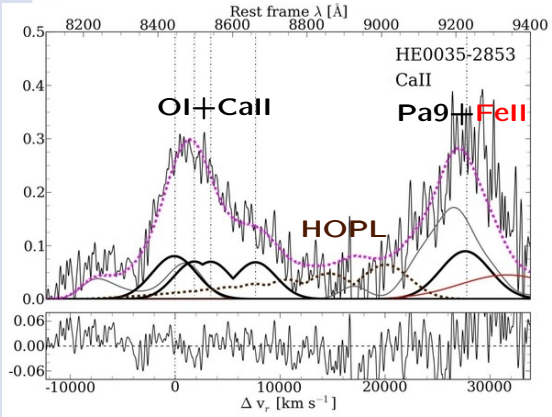
Background Image credit:
Chandra X-ray Observatory

Low ionization lines in quasars: IR CaII Triplet and OI λ8446

Mary Loli Martínez-Aldama (IA-UNAM)
Supervisors: Deborah Dultzin (IA-UNAM) & Paola Marziani (OAP-INAF)

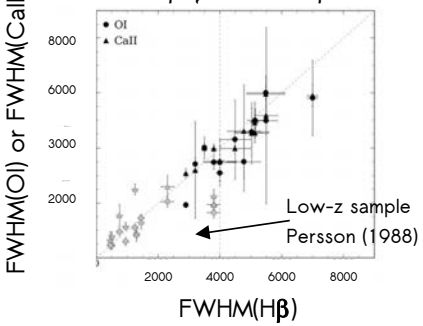
Multicomponent fits



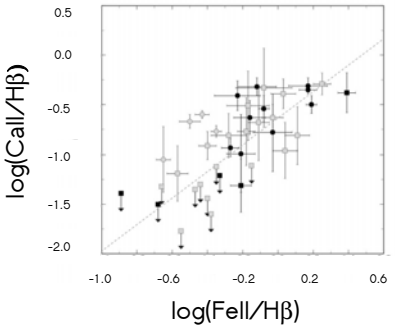


Dynamically:

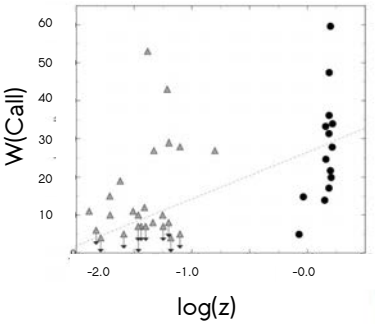
Hβ ≥ O I ~ CaIIβ



FeII/CaII show the similar physical conditions and behavior -> Accretion disk

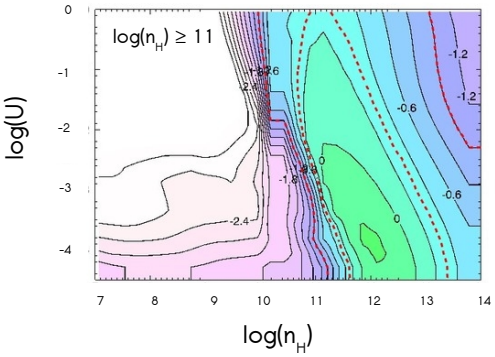


≠ W(CaII) for low and high z

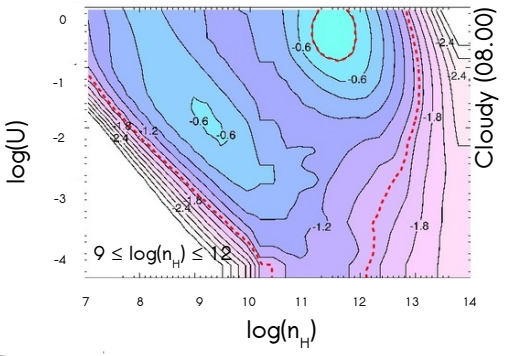


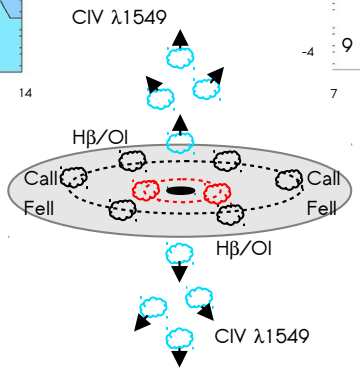
¿Are OI and CaII (or FeII) emmited in the same region?

log(CaII/Hβ)



log(OI/Hβ)





A possible geometry for the BLR

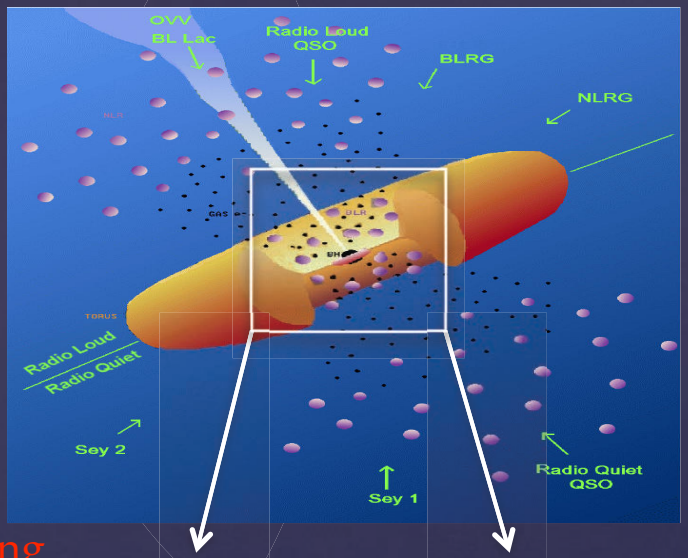
Differential interferometry of the Broad line region of QSOs

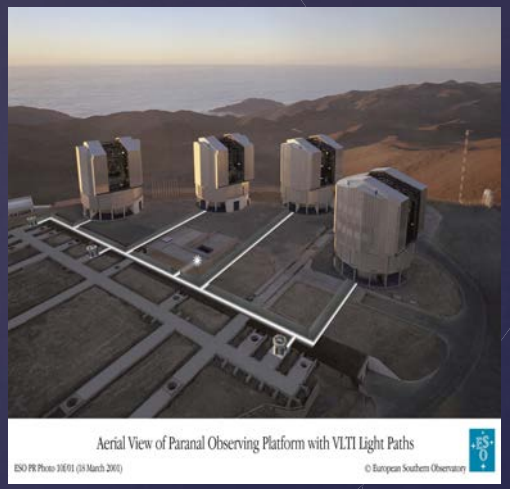
Suvendu Rakshit
IRAP PHD III year
Observatoire De La Cote D'Azur

Research interest:

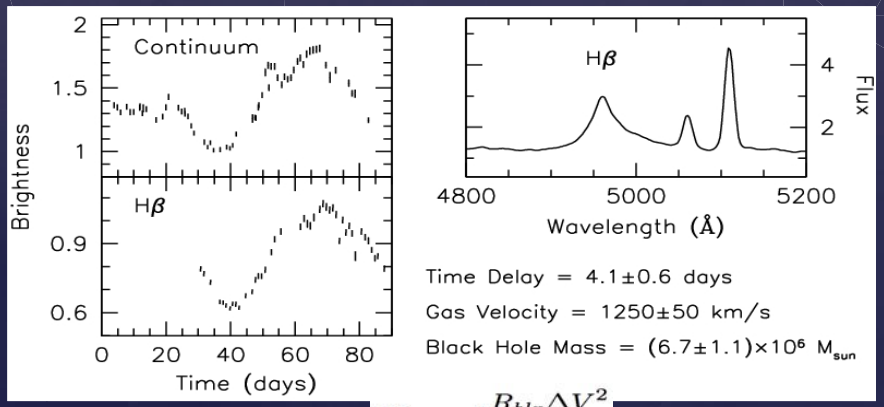
- Central engine of AGN: BH, AD, BLR and TORUS
- Variability study of BLR
- Near-IR Interferometry of BLR
- Interferometric instrumention

Use of Cloudy: Modeling IR spectrum. Radial emissivity and emission line lag calculation for low ionized lines.



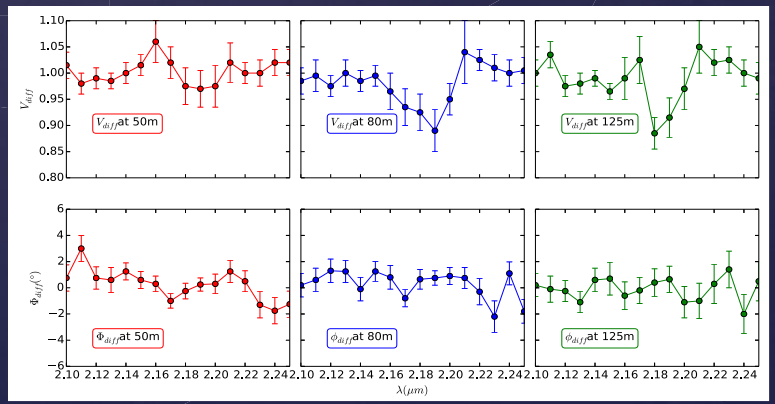


Reverberation mapping



$$M_{bh} = f\frac{R_{blr}\Delta V^2}{G}$$

Interferometry



NLR, IGM

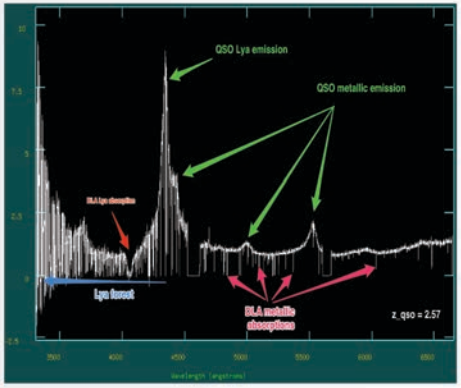
- Quiret, Smith, Wildy

Samuel Quiret

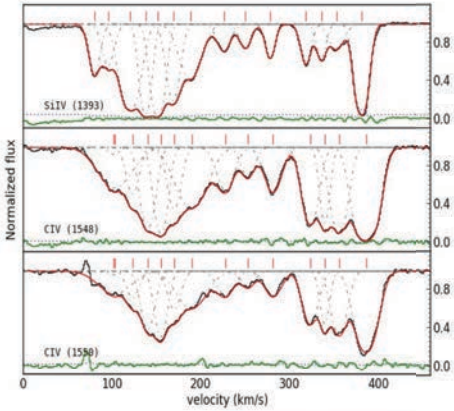
2nd year PhD student at Laboratoire d'Astrophysique de Marseille

Supervisors: Bruno Milliard and Céline Péroux

Research interests: studying the evolution of galaxies through their interaction with the multiphase IGM



In absorption: metallicity measurements of large HI column density systems (DLAs and subDLAs) from high resolution background quasar spectroscopy

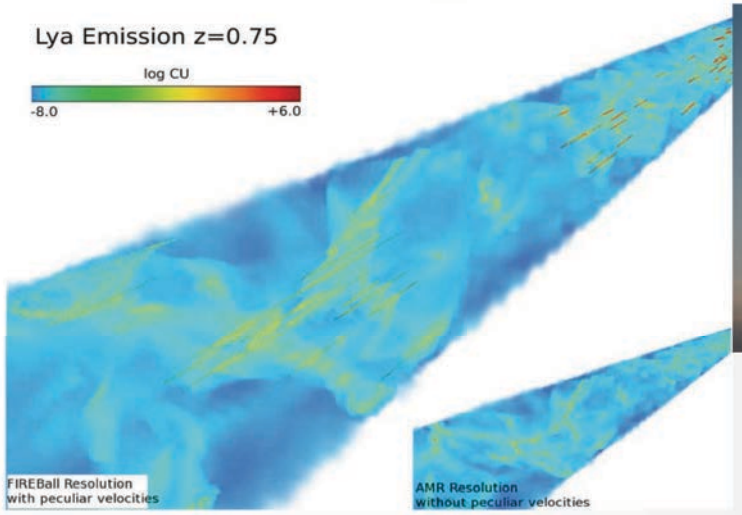


In emission: optimizing science performance of an UV pathfinder spectrograph (FIREBall), aiming at observing the faint diffuse emissions from these media at low redshift (z<~1)

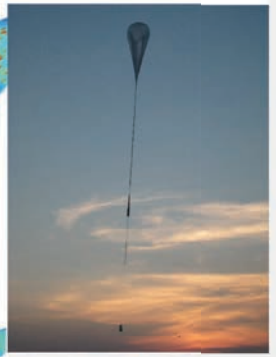
Instrumentation: modeling and optimization of grating's efficiency

Simulation: predicting the emission using RAMSES zoom simulation

Need CLOUDY to predict those emission!



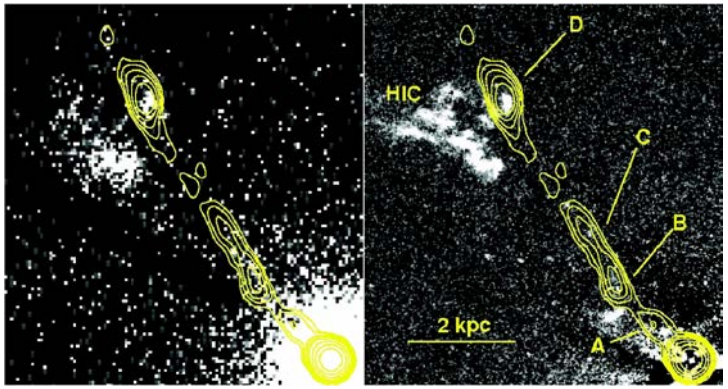
Frank+12

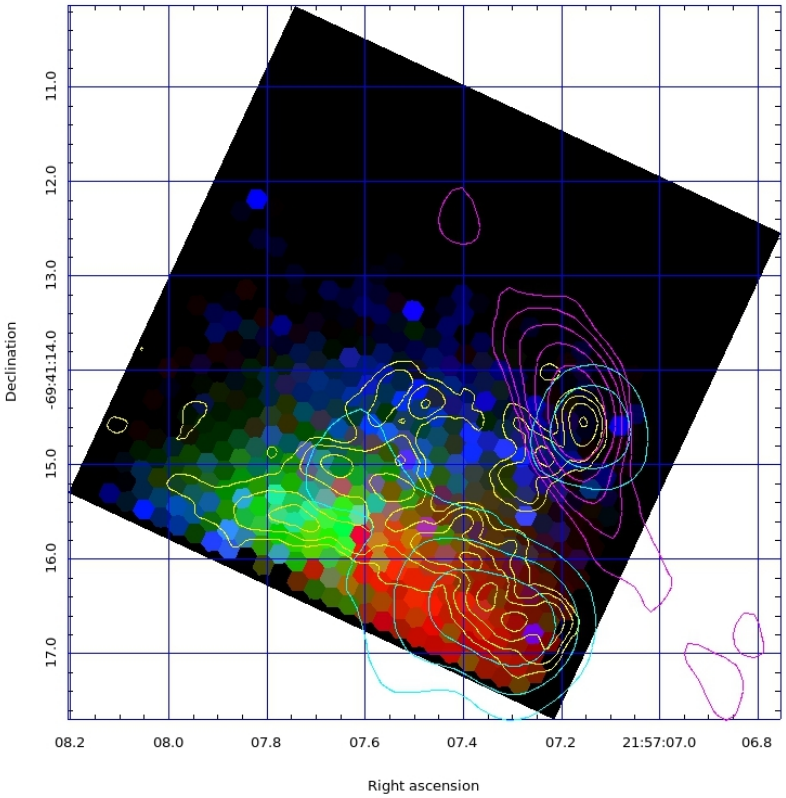


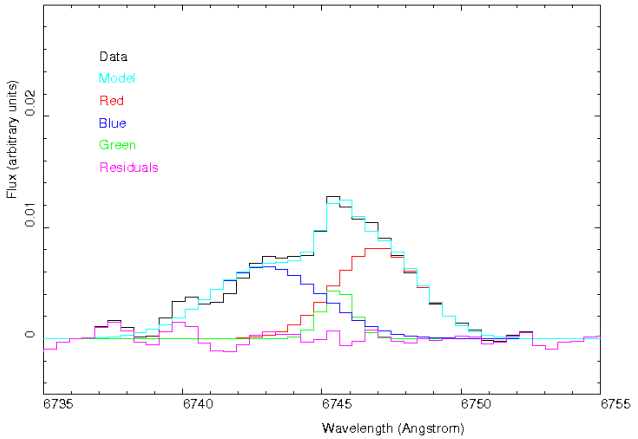
FIREBall in the sky!!

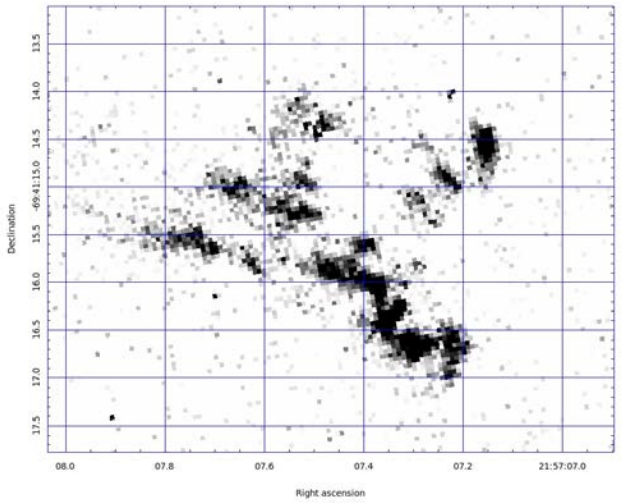
AGN Jet-Cloud Interaction in PKS B2152-699

Duncan Smith, Astrophysics Group,
School of Physics, University of Bristol









University of Leicester

Variability in AGN absorption lines

Conor Wildy

- Absorption lines in the spectra of AGN are normally blueshifted relative to the emission line centre.
- Hence they are indicative of outflowing material
- Absorption lines can be present at a wide range of velocity centroids (up to 0.2c) and velocity widths (up to 0.1c).
- Much research has been carried out into Quasar *Broad Absorption Lines* (BALs) which span at least 2000 km/s and are seen mainly in the Ultraviolet (UV)
- Narrower absorption lines are also apparent in both quasars and Seyfert 1 AGN and are seen in the wavebands spanning Infra-red to X-ray observations.

Broad Absorption Line Quasars

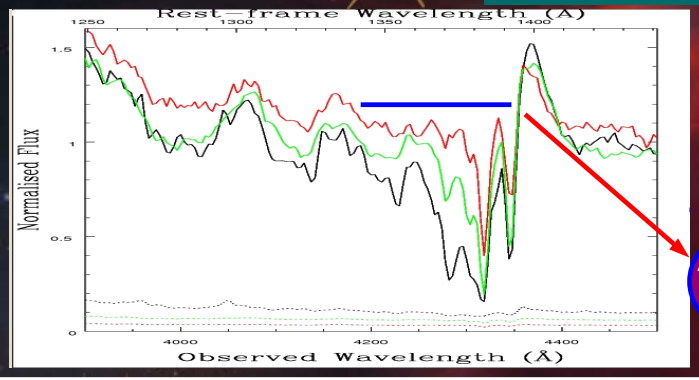
Artist's impression of outflow from Seyfert galaxy NGC3783
Credit: European Southern Observatory (www.eso.org)

Outflowing Plasma

Supermassive Black Hole

Outflowing Plasma

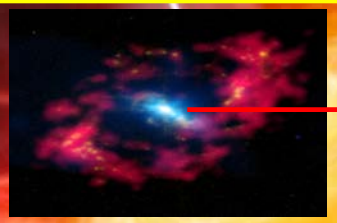
Spectrum extracted, includes absorption lines



Black: May 2005
Red: May 2008
Green: May 2011

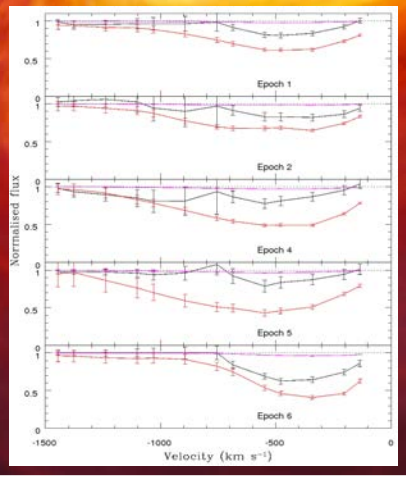
Absorption width >10 000 km/s!

Seyfert 1 Galaxy NGC 4151



Strong X-ray emission (in blue) indicates high-energy process (supermassive black hole accretion).

Credit: Chandra observatory (http://www.chandra.harvard.edu/photo/2011/n4151/)



- Five epochs of spectral data obtained from metastable Helium (HeI*) in optical (388.9 nm) and near-IR (1.083 μm)
- Metastable helium sensitive to high column densities in optical waveband. (Leighly et al. 2011)
- Product of oscillator strength and wavelength is 23.3 times weaker in optical than in Near-IR, therefore optical is more "resistant" to saturation.
- Absorption line variability likely due to motion of absorber across the line of sight.