Some new ideas to study the Quasar's spectra

The example of CIV emission lines in the UV spectra of 21 HiBALQSOs

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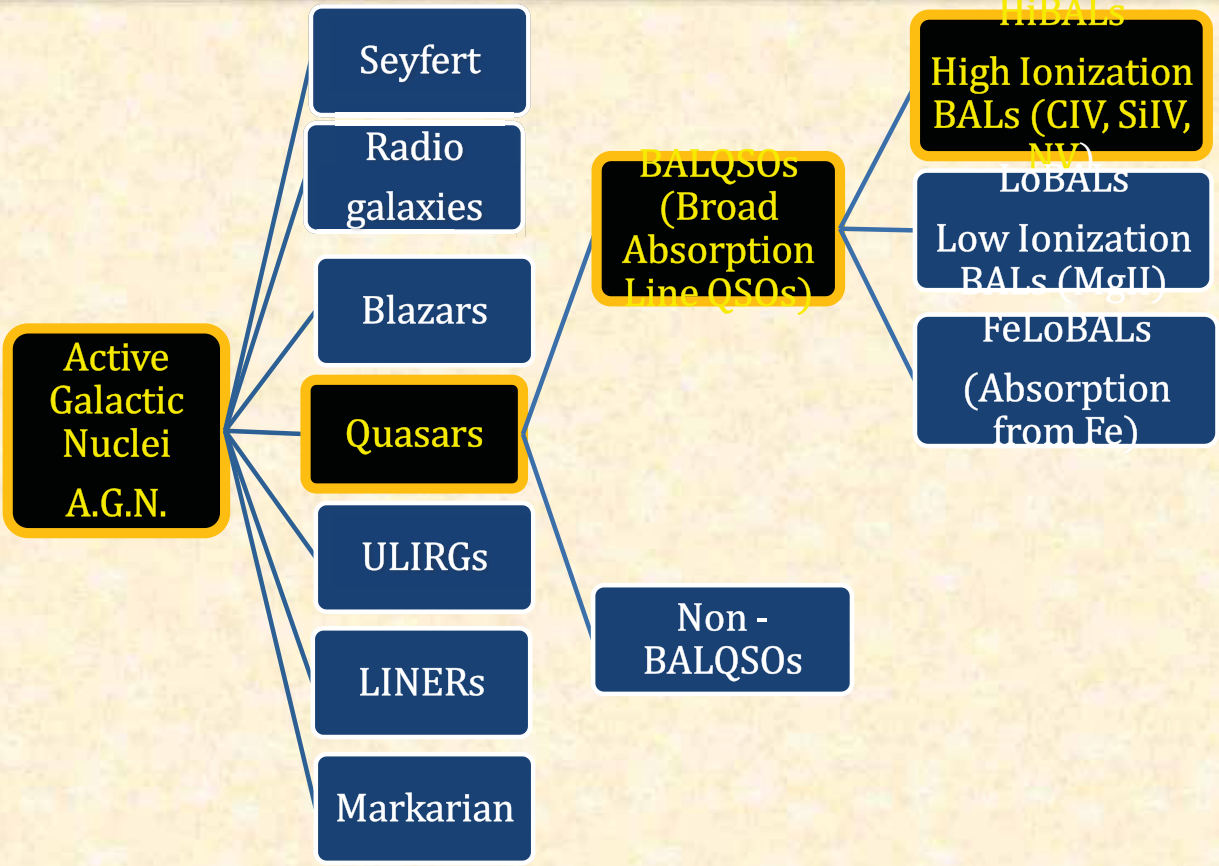


BAL Quasar is a categiry of Active Galactic Nuclear (AGN)

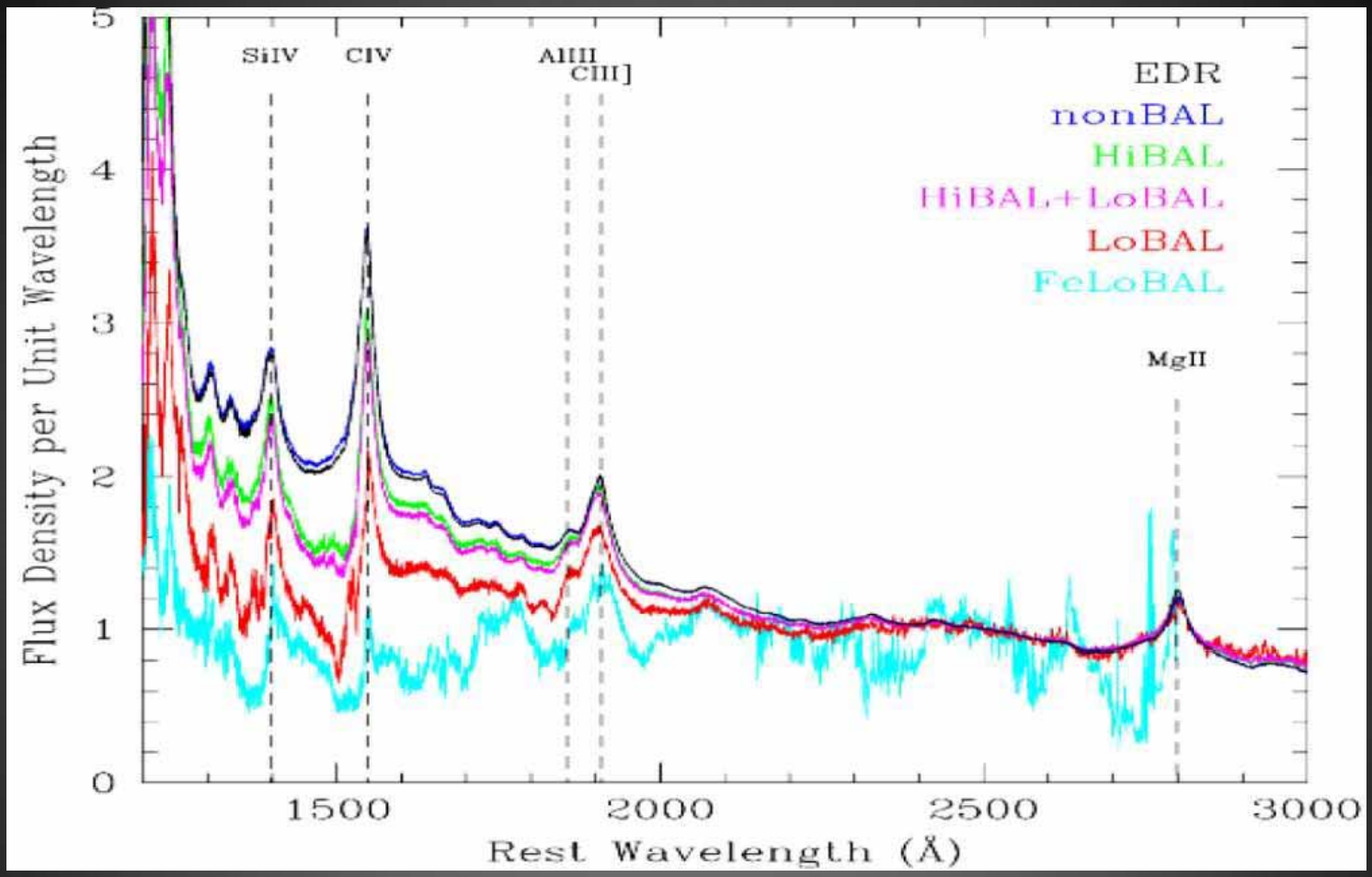
Spectral classification of BALQSOs

- BALQSOs are classified in three subcategories based on the material producing the BAL profiles.

- **High-ionization BALQSOs (HiBALs)** contain strong, broad absorption troughs short-ward of high-ionization emission lines (such as C IV, Si IV, N V) and are typically identified through the presence of C IV absorption troughs.

- **Low-ionization BALQSOs (LoBALs) contain HiBAL** features but also have absorption from low-ionization lines such as Mg II.

- **LoBALs with excited-state Fe II or Fe III** absorption are called FeLoBALs.



In this figure we can see some BALQSOs spectra of all the above categories

The HiBAL QSOs absorption Spectral Lines

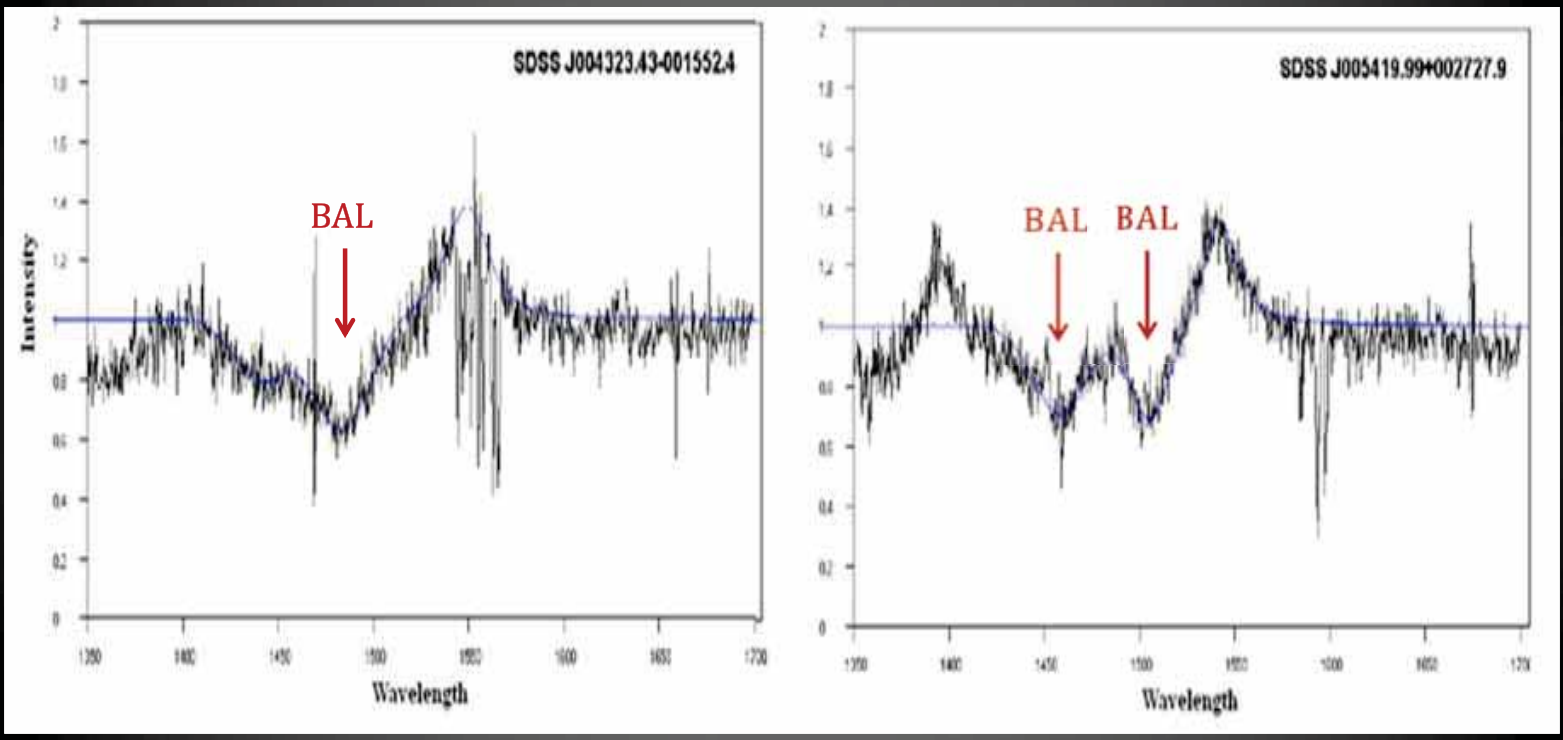
In the spectra of HiBAL QSOs we can detect absorption lines separated in subgroups below.

Absorption lines

1. **Broad Absorption Lines (BALs)**
2. **Narrow Absorption Lines (NALs) with simple profiles**

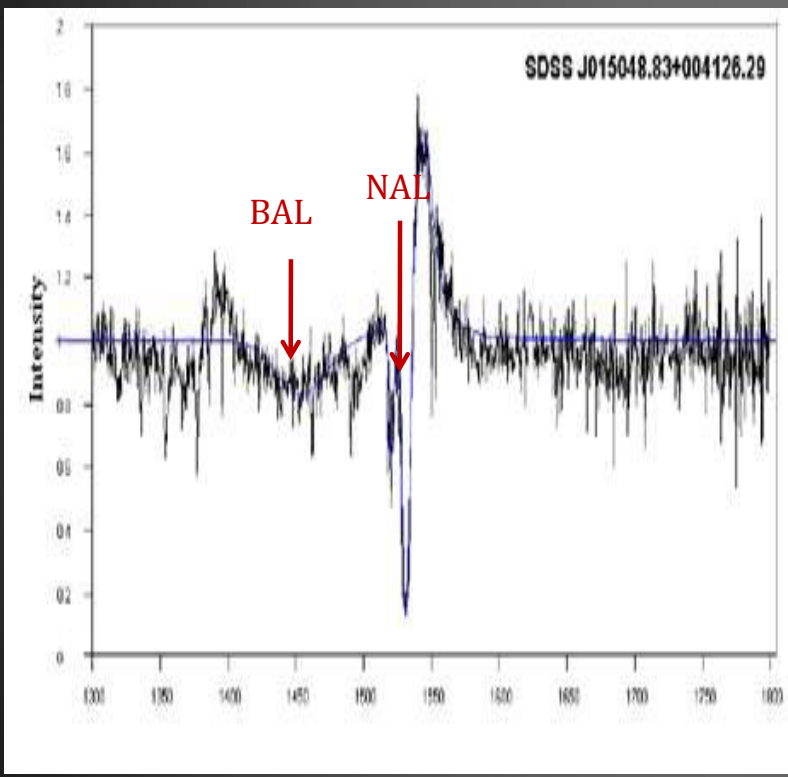
1. The broad absorption lines

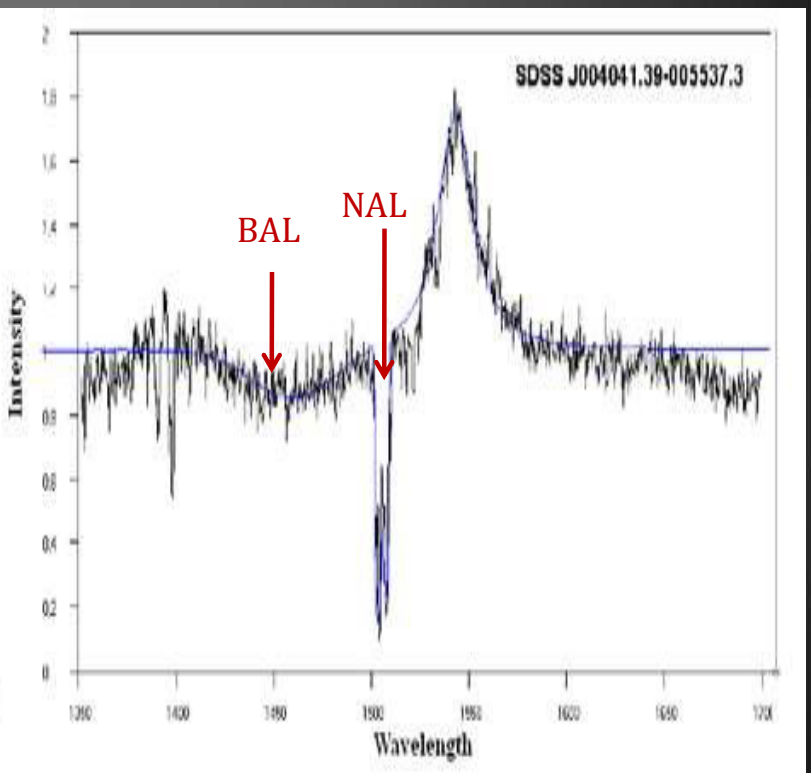
The first subgroup of absorption lines includes lines that show very broad and complex profiles. It is known that BLRs comprise a large number of plasma clouds. As a result the very broad lines represent a number of lines of the same ion and the same wavelength shifted at different $\Delta\lambda$. This effect occurs because these lines are created in different clouds that move radially and spin with different velocities (Danezis et al. 2007).


SDSS J004323.43-001552.4
BAL
Intensity
Wavelength
SDSS J005419.99+002727.9
BAL
BAL
Wavelength

2. Narrow Absorption lines (NALs) with simple profiles

The second subgroup of absorption lines includes spectral lines with simple profiles. One can fit these lines using classical distributions such as Gauss, Lorentz or Voigt. In these cases we may be able to understand the phenomena that take place in the regions which produce the simple lines, but we are not able to calculate the values of the physical parameters that describe the absorbing clouds.

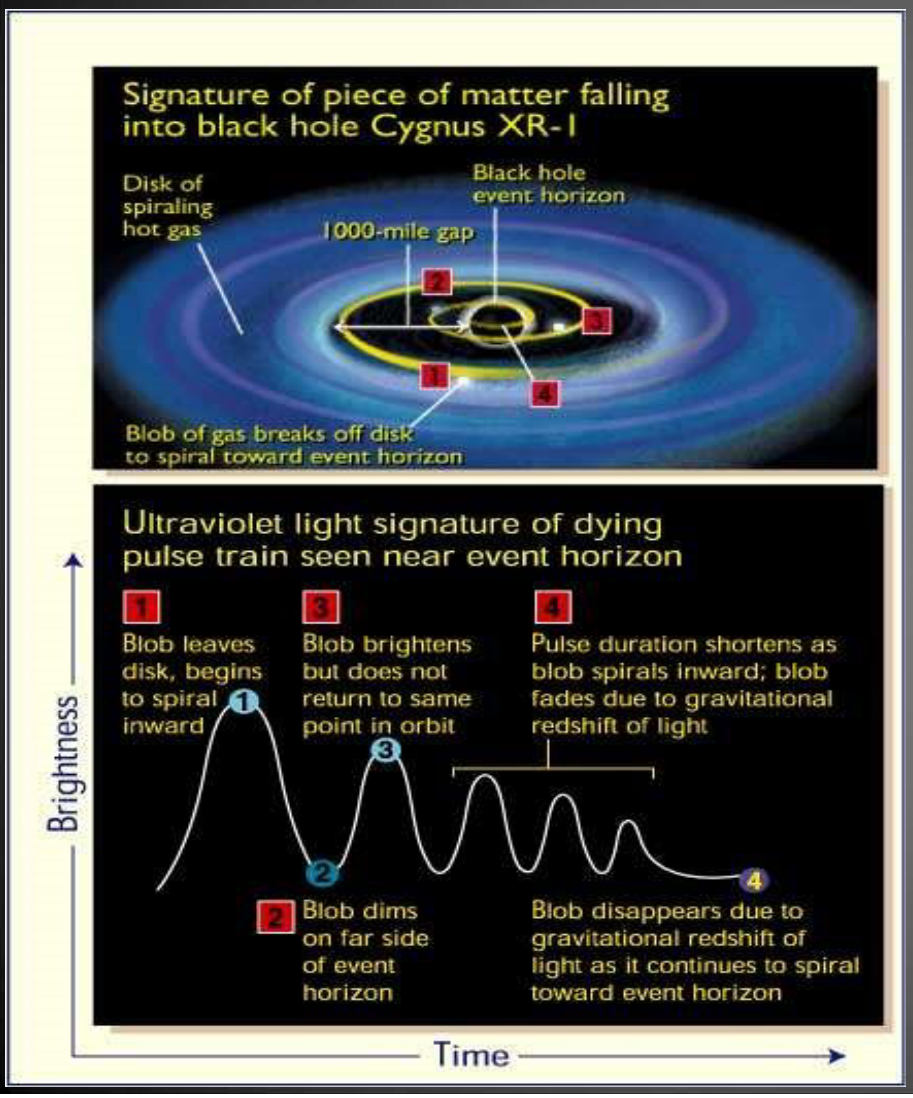

SDSS J015048.83+004126.29
BAL
NAL
Intensity


SDSS J004041.39-005537.3
BAL
NAL
Intensity
Wavelength

The HiBAL QSOs emission Spectral Lines

We can detect three region as the origin of emitting radiation

1. Blobs in the inner of accretion disc



Jian-Min Wang1, Ye-Fei Yuan2, MeiWu1, and Masaaki Kusunose3
The Astrophysical Journal Letters

Hideyuki kamaya1
The Astrophysical Journal, 510:862È866, 1999 January 10

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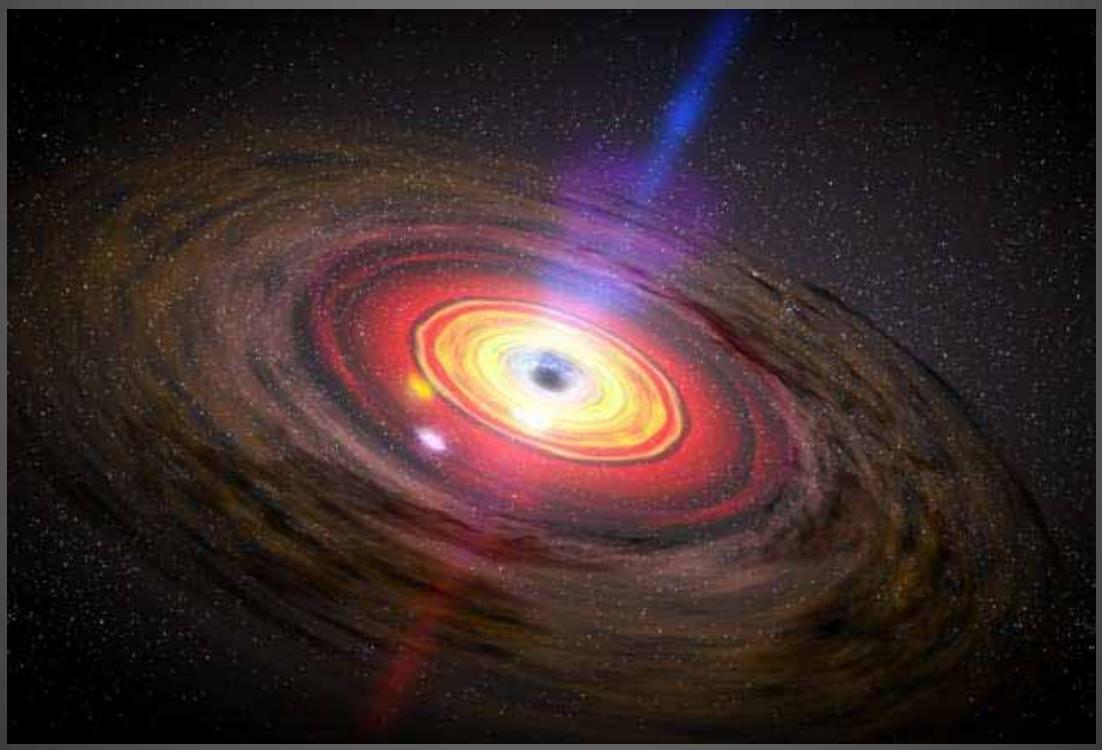
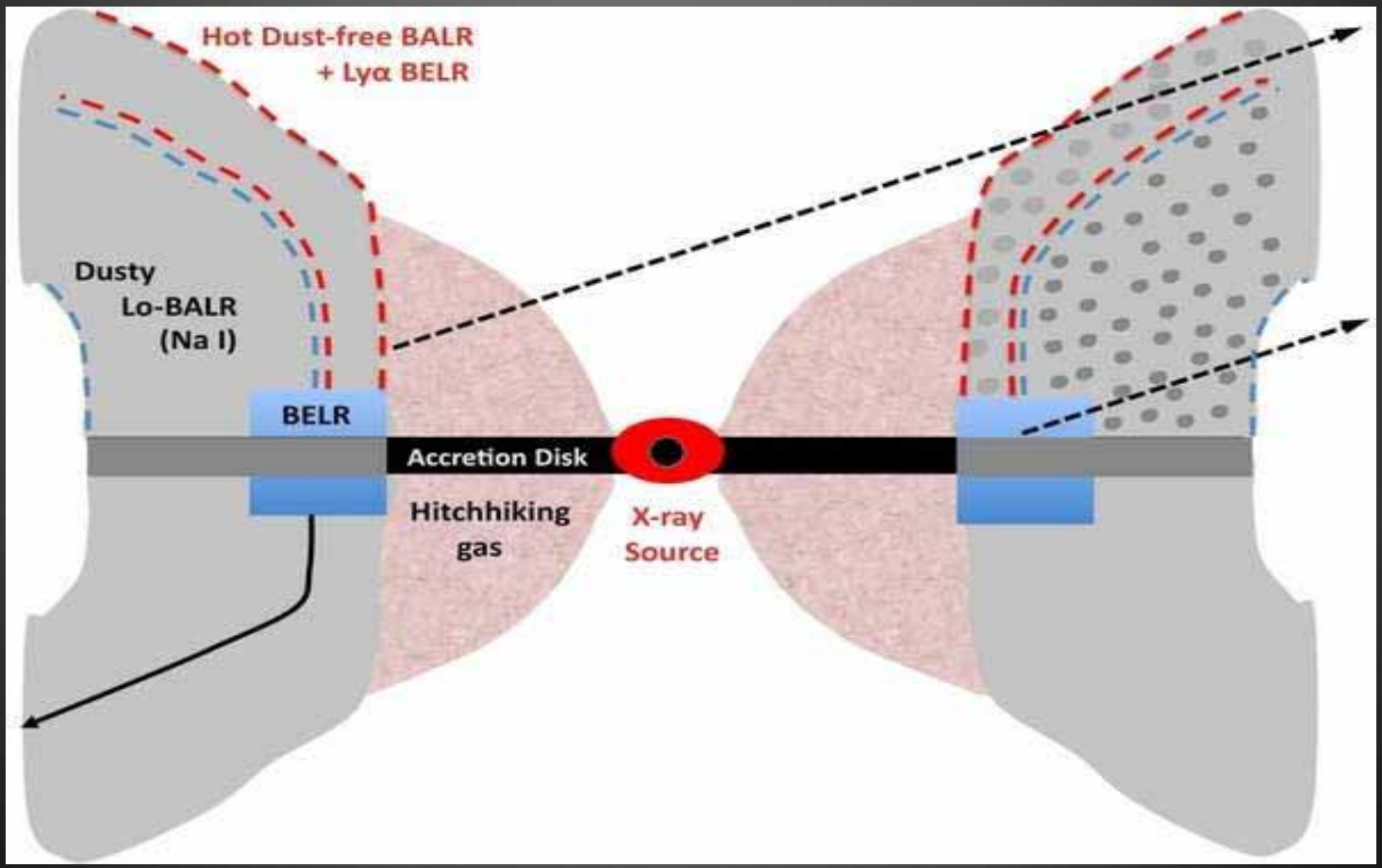
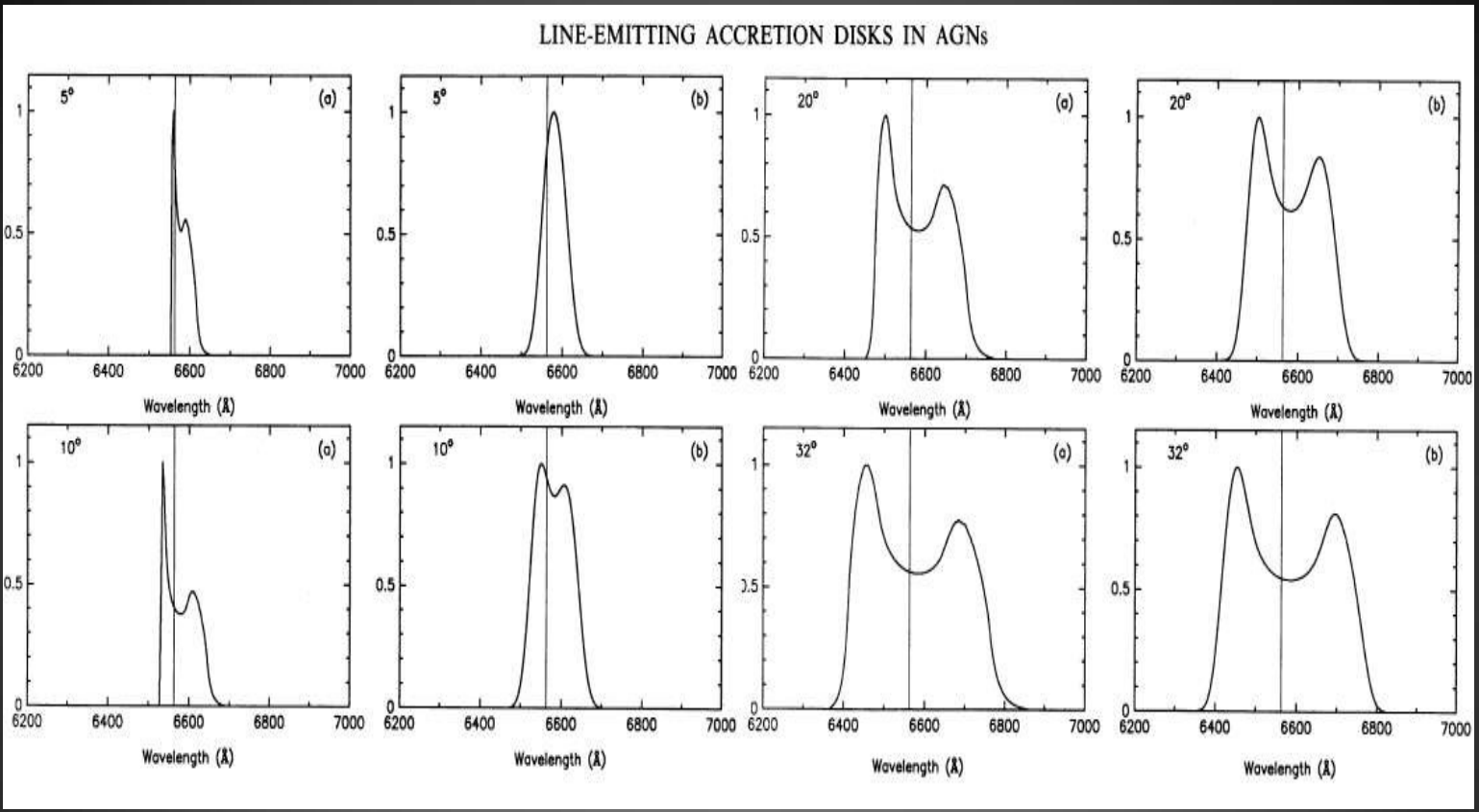


3. Emitting radiation layers in the external region of the accretion disc





In this figure we can see the theoretical emission profile s arise from the disc model as a function of the inclination angles (Chen, K. & Halpern, J. P. 1989)

4. Broad and Narrow line regions