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Title	EW [OIII] as an orientation indicator
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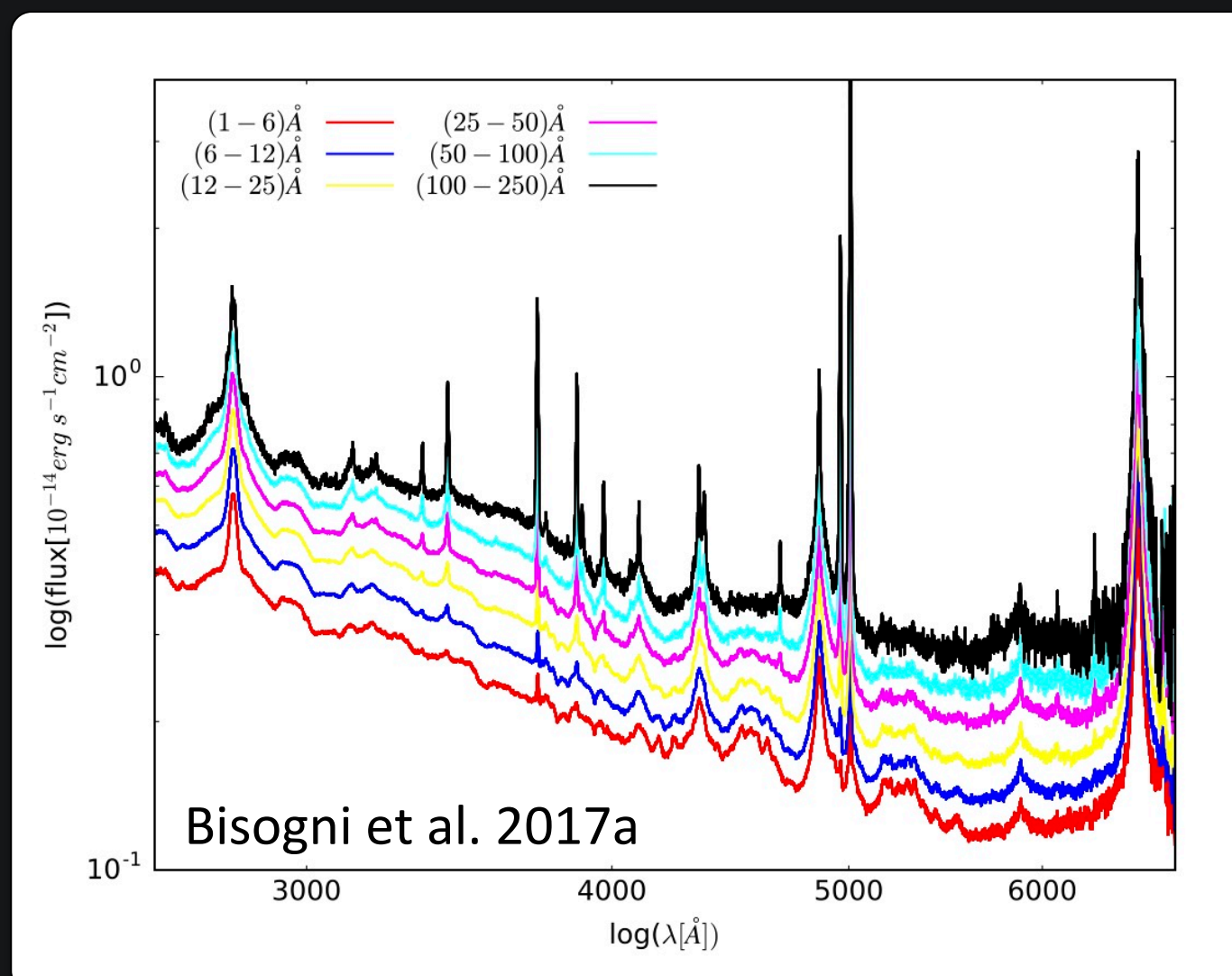
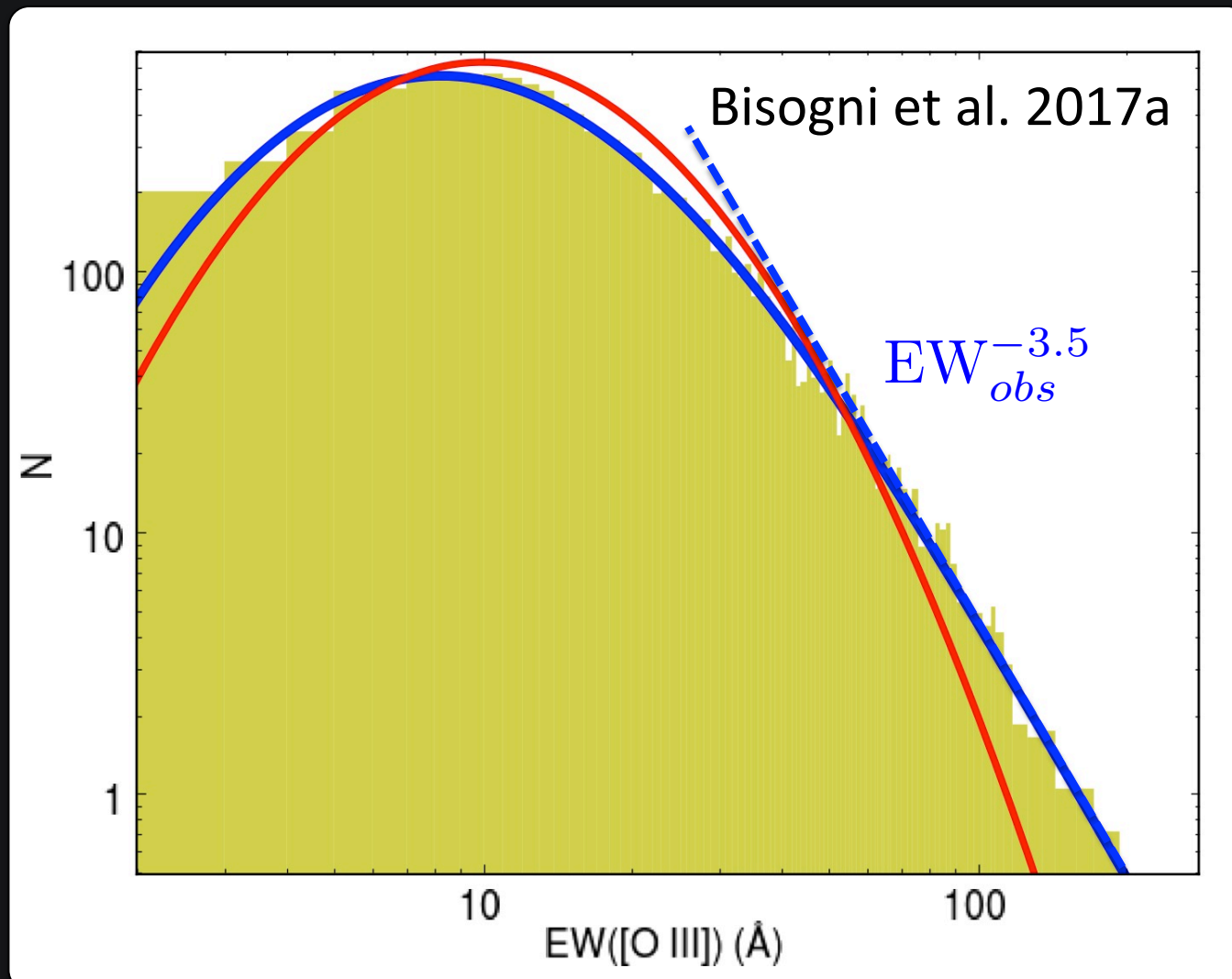
Abstract:

We present an analysis of the average spectral properties of $\sim 12,000$ SDSS quasars as a function of accretion disk inclination, as measured from the equivalent width of the [O III] 5007Å line. The use of this indicator on a large sample of quasars from the SDSS DR7 has proven the presence of orientation effects on the features of UV/optical spectra, confirming the presence of outflows in the NLR gas and that the geometry of the BLR is disk-like. Relying on the goodness of this indicator, we are now using it to investigate other bands/components of AGN. Specifically, the study of the UV/optical/IR SED of the same sample provides information on the obscuring “torus”. The SED shows an increase of the IR fraction moving from face-on to to edge-on positions, in agreement with models where the torus is coaxial with the accretion disk, and characterized by a clumpy structure.

[Bisogni et al. 2017a, MNRAS, 464, 385B, Bisogni et al. 2017b, in prep.]

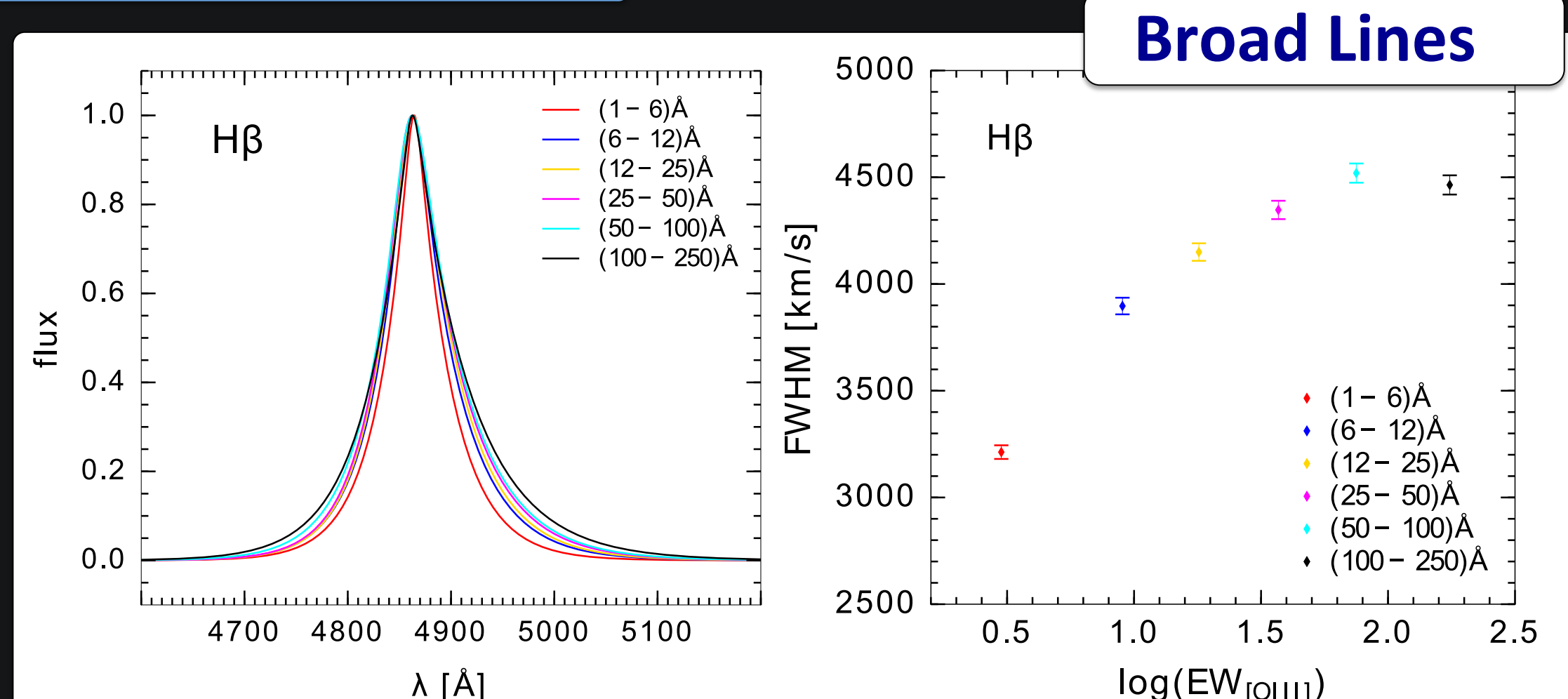
INTRODUCTION:

The observed EW[OIII] distribution shows a power law tail for high EW values that can be produced only by orientation (Risaliti et al. 2011).

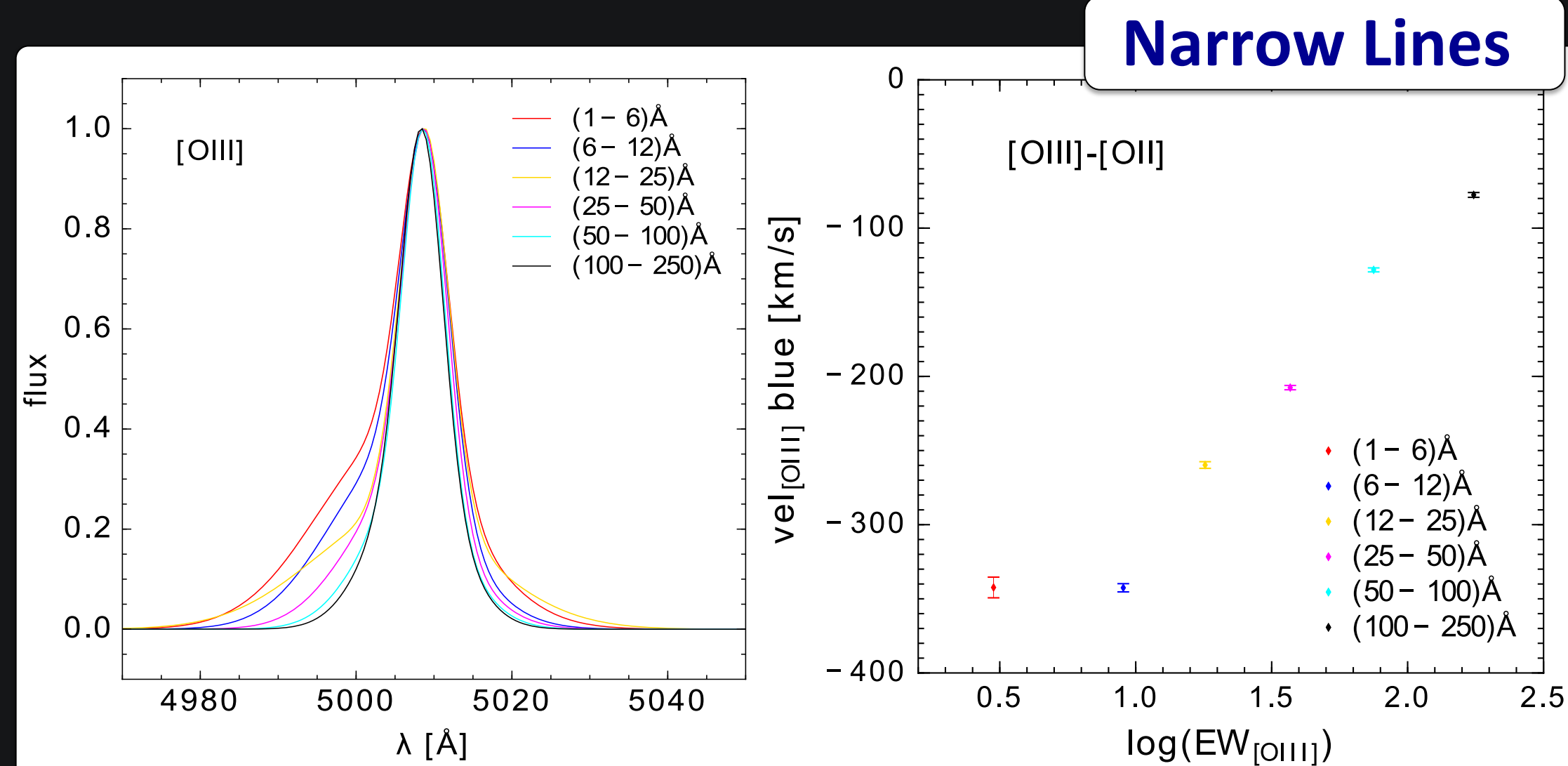


We split the sample in EW[OIII] bins and look for orientation effects on spectral emission features of representative spectra (Bisogni et al. 2017a)

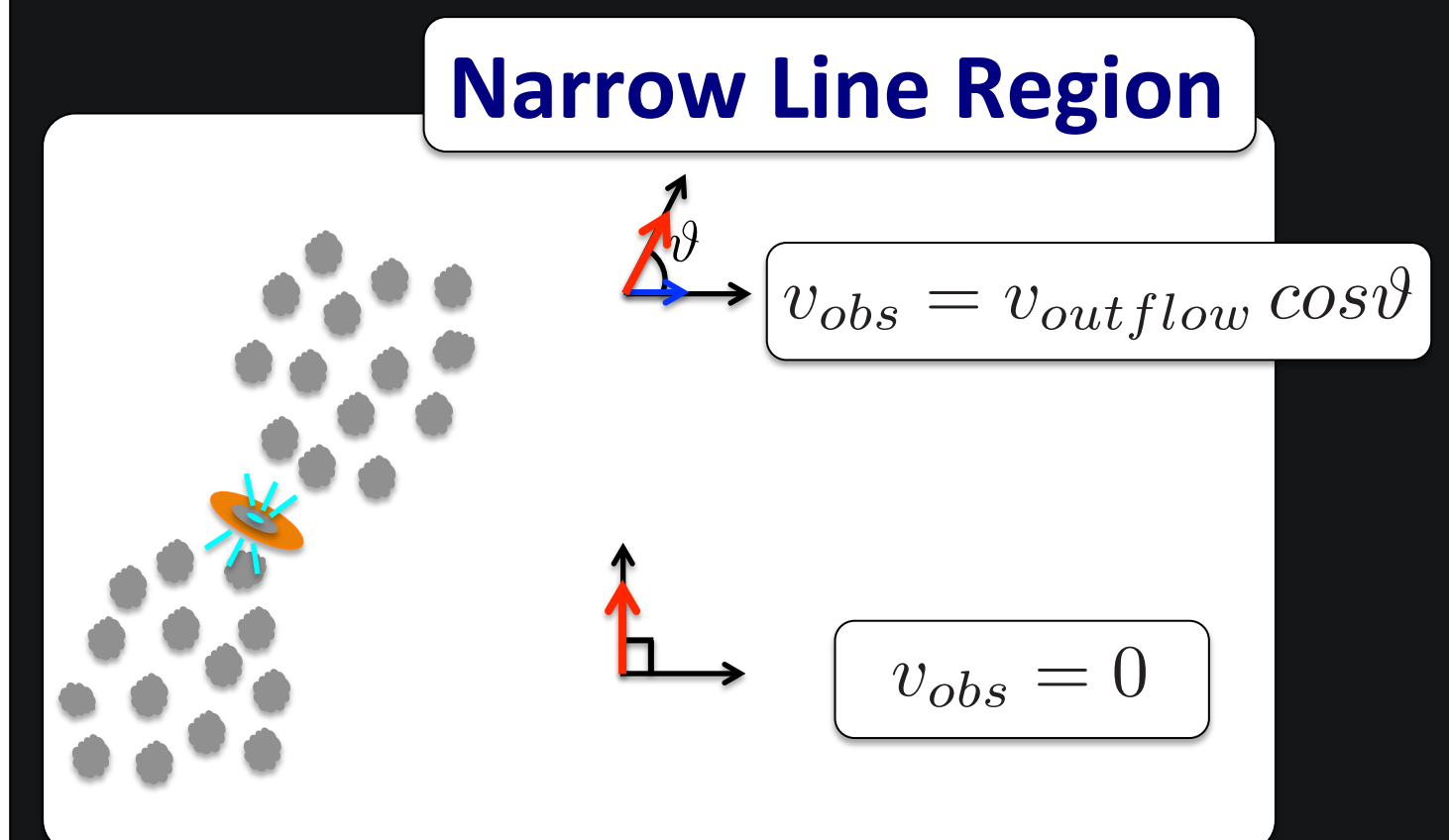
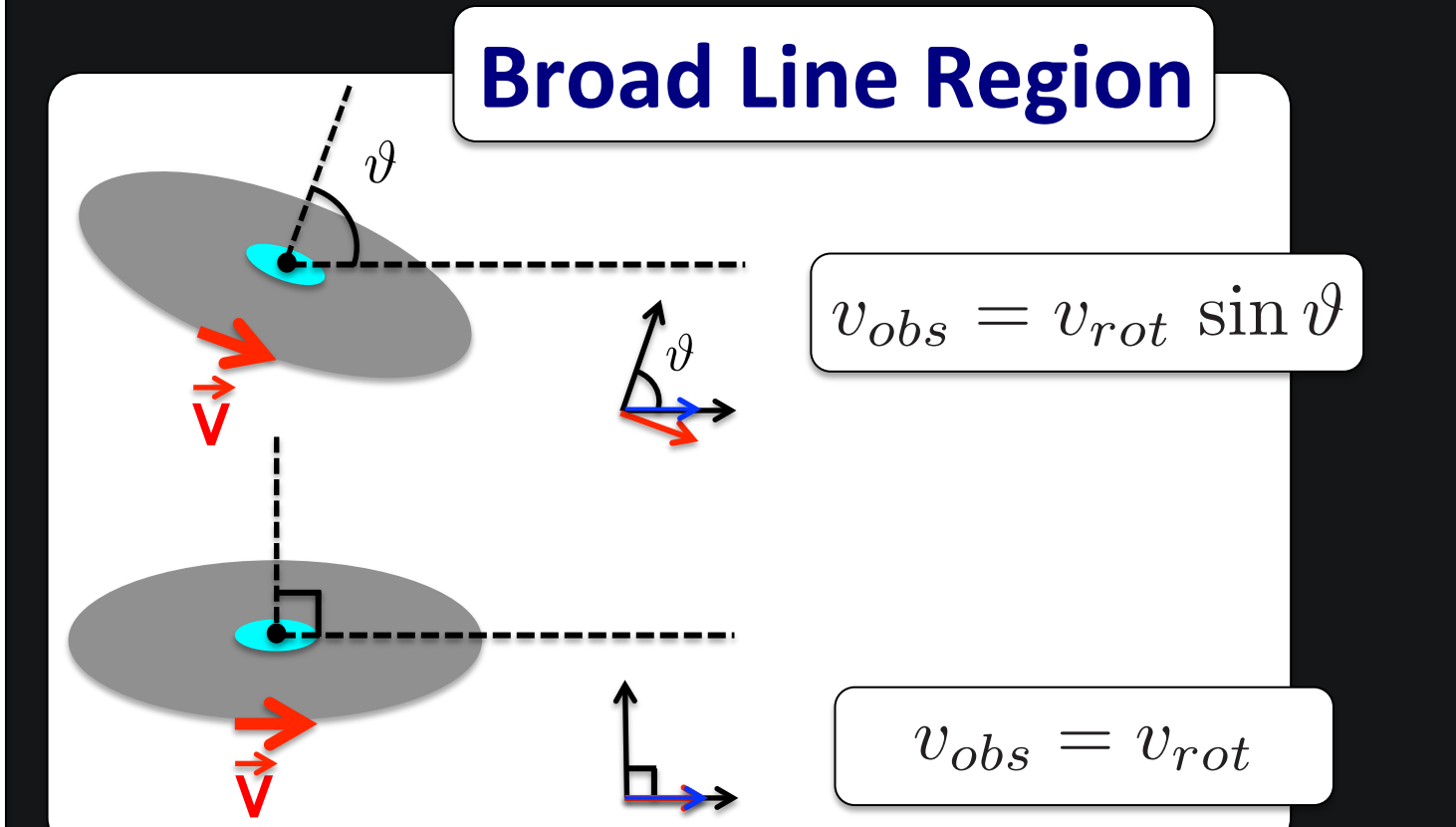
Results on optical spectra:



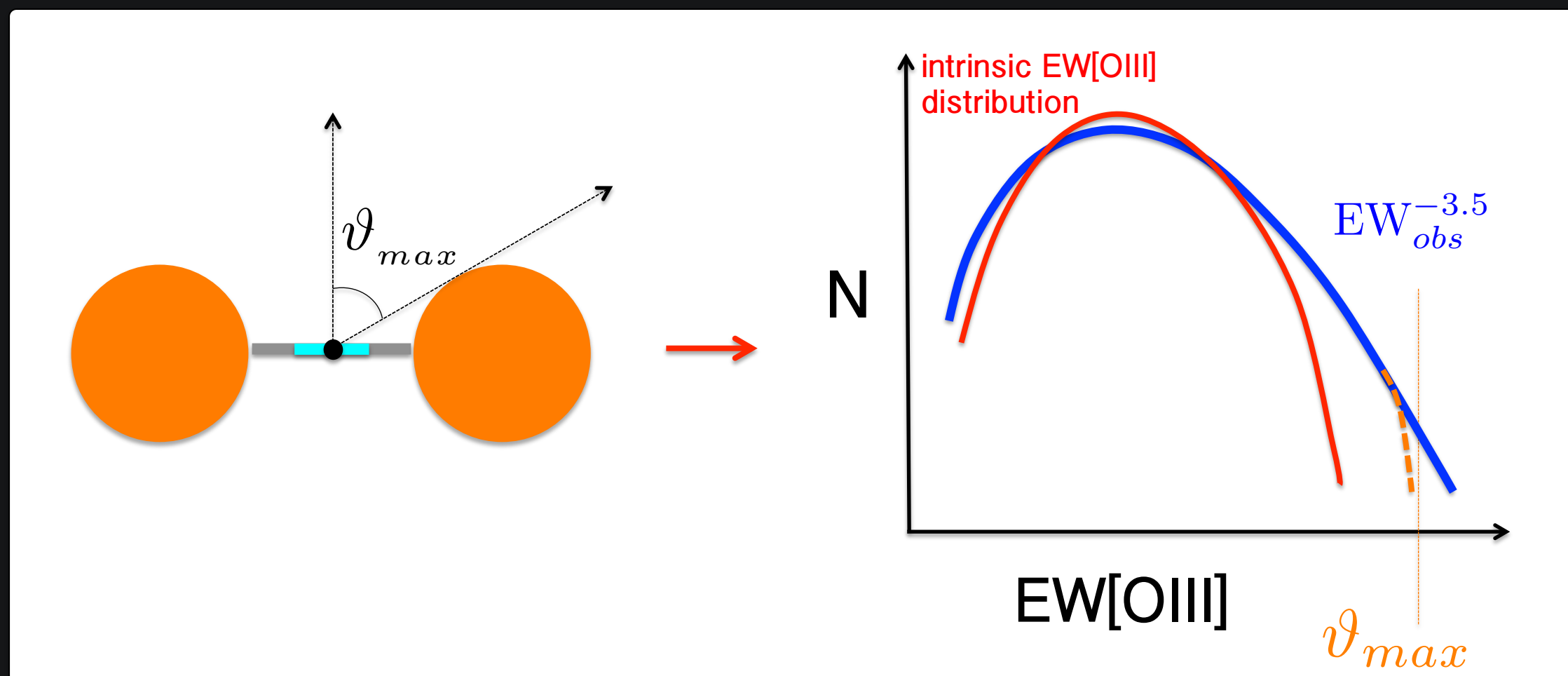
The width of the Broad Lines increases with increasing EW[OIII], as expected when observing objects at higher inclinations



The absolute value of the velocity of the [OIII] blue component decreases with increasing EW[OIII], as expected when observing objects at higher inclinations



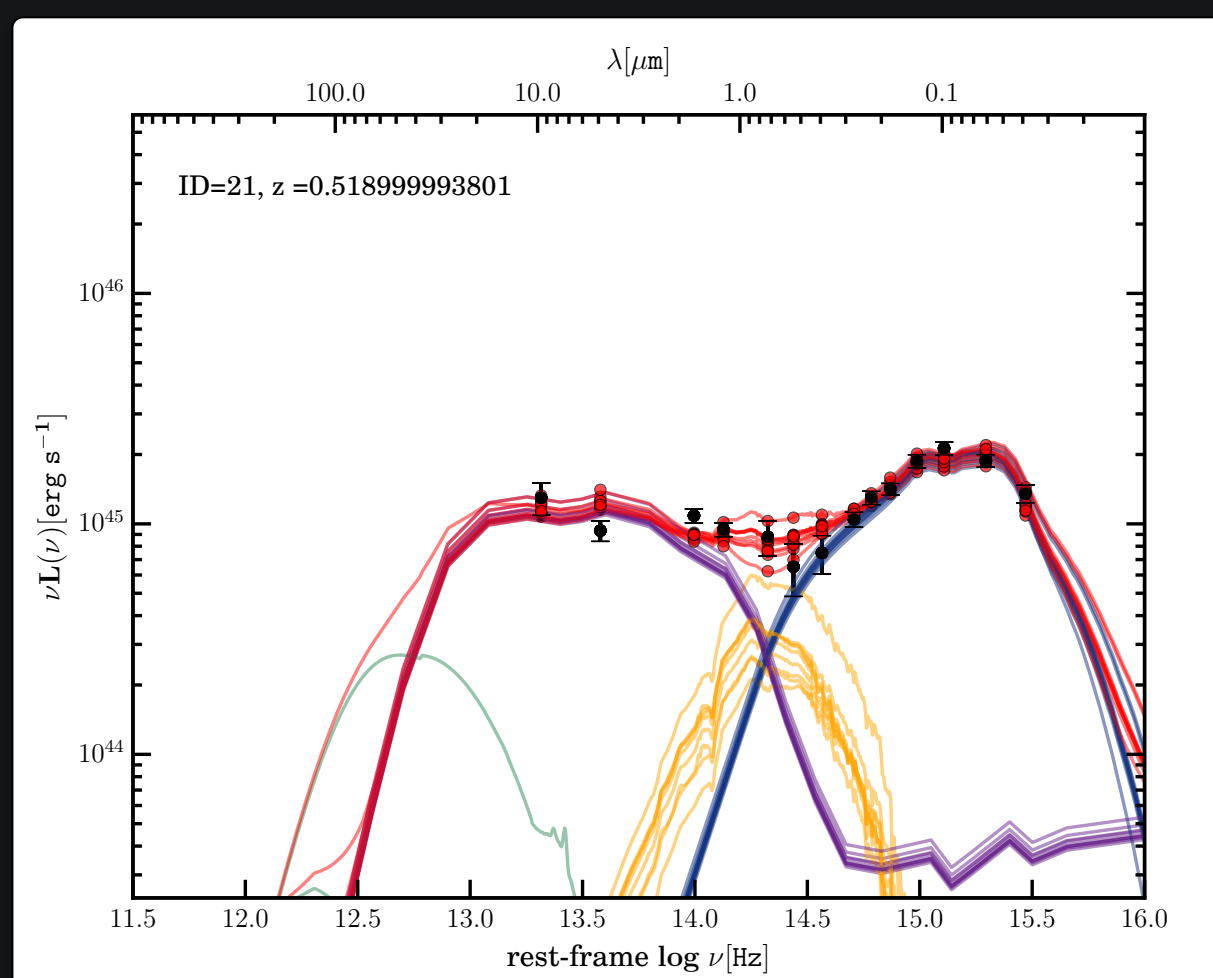
Implications for the Torus



If the Torus has the smooth structure depicted in the Unified Model for AGN, then exists a maximum angle over which we should not see any emission. This is NOT what seen in the observed distribution.

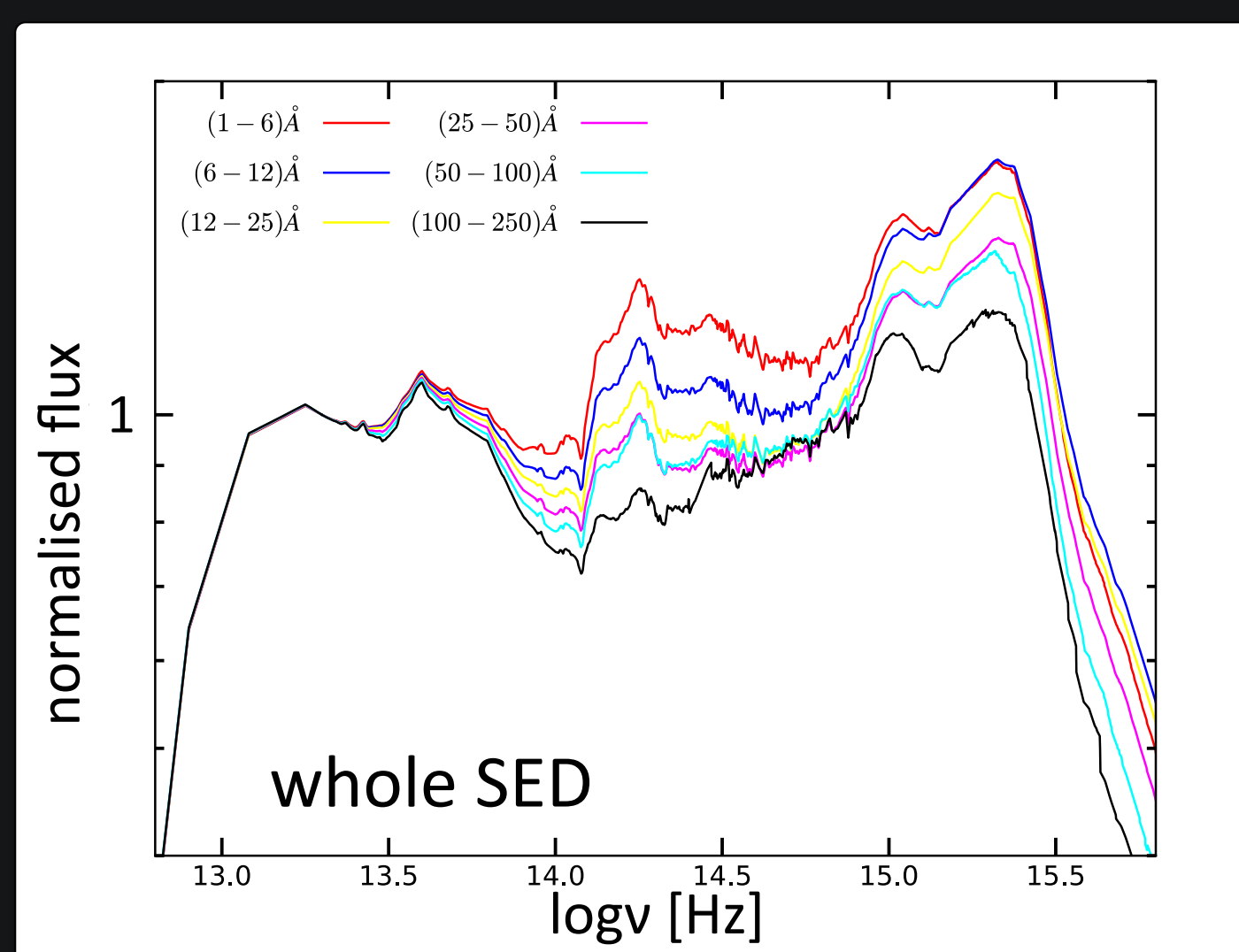
Method:

AGNfitter (Calistro Rivera et al. 2016) was used to obtain the SED for each object. We considered data (or upper limits) from **WISE** (Wright et al. 2010), **2MASS** (Skrutsie et al. 2006), **GALEX** (Martin et al. 2005) and **SDSS** (Shen et al. 2011).

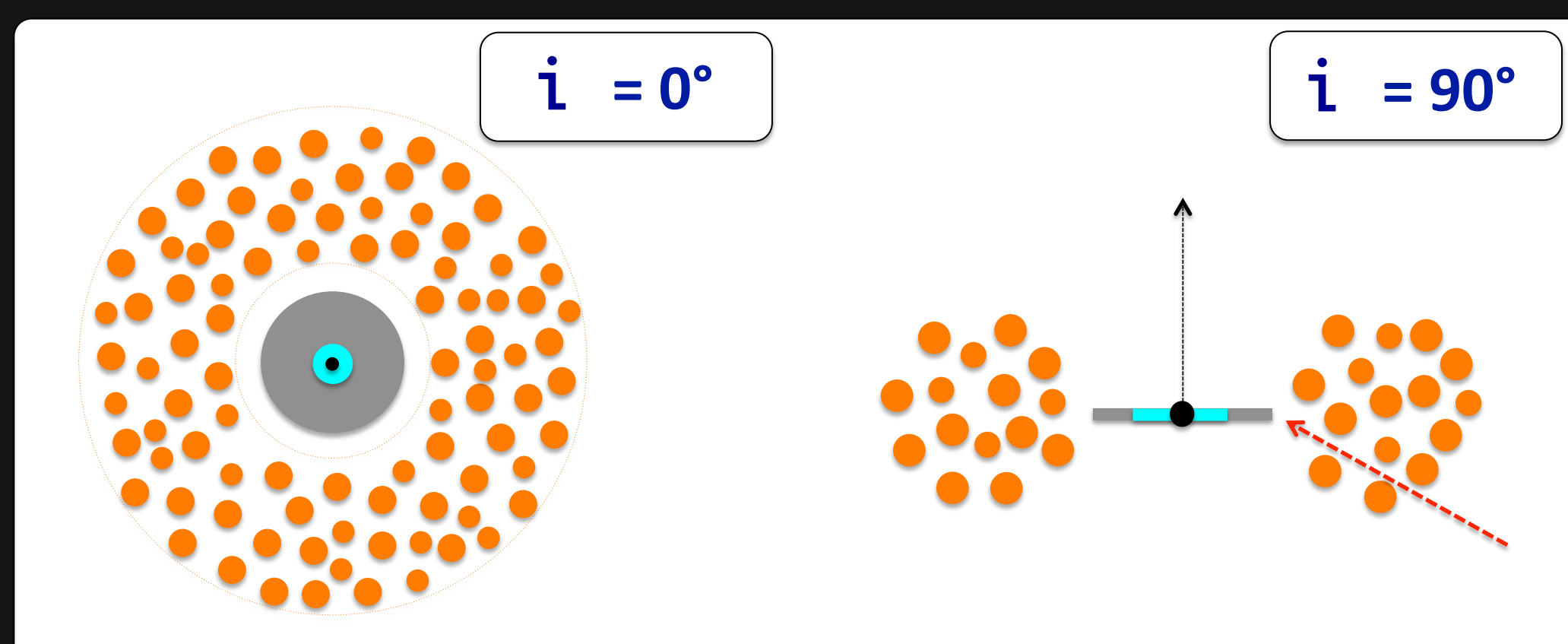


Example of SED fitting with AGNfitter; green, purple, orange and blue components represent starburst, torus, galaxy and disk emissions respectively

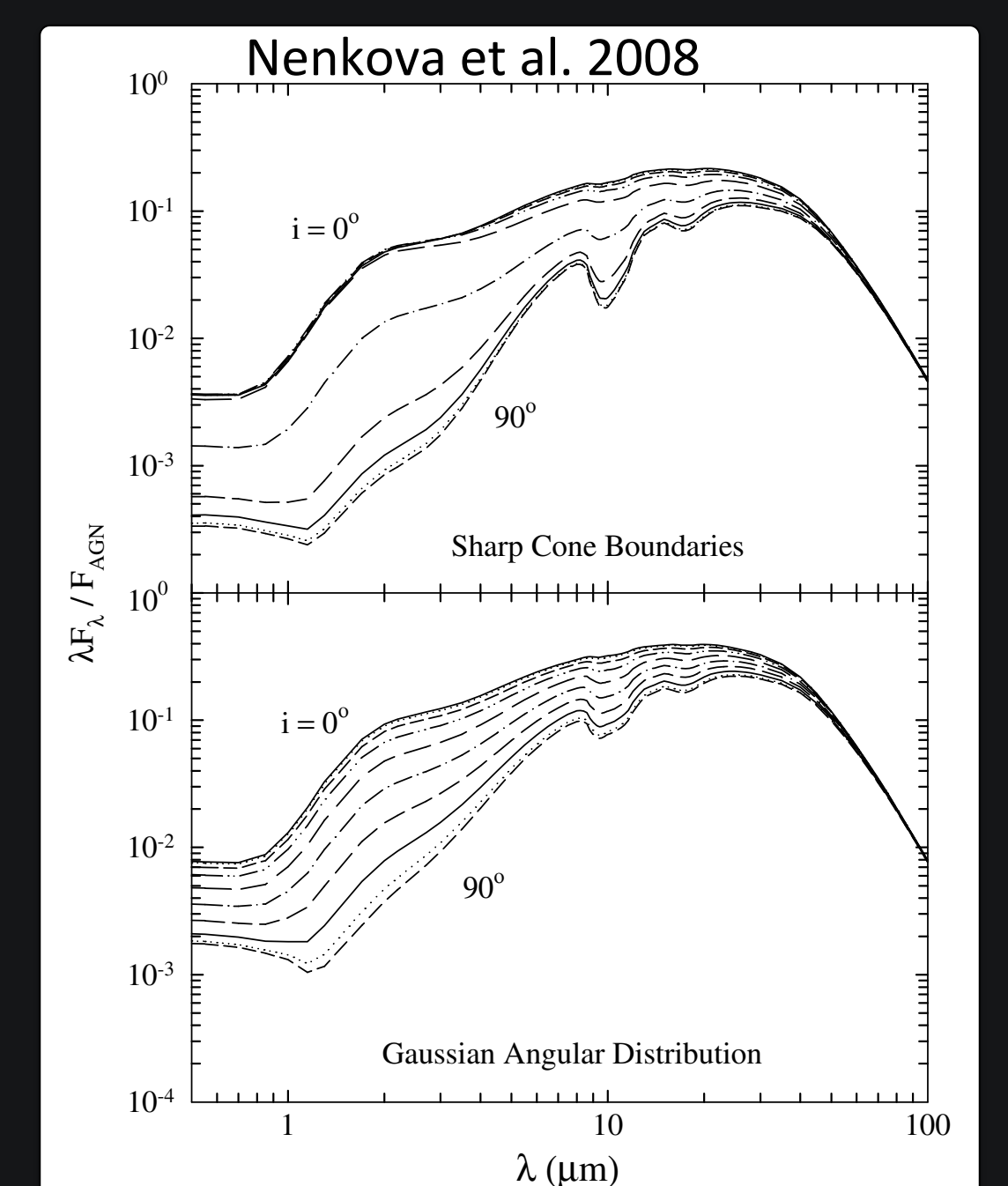
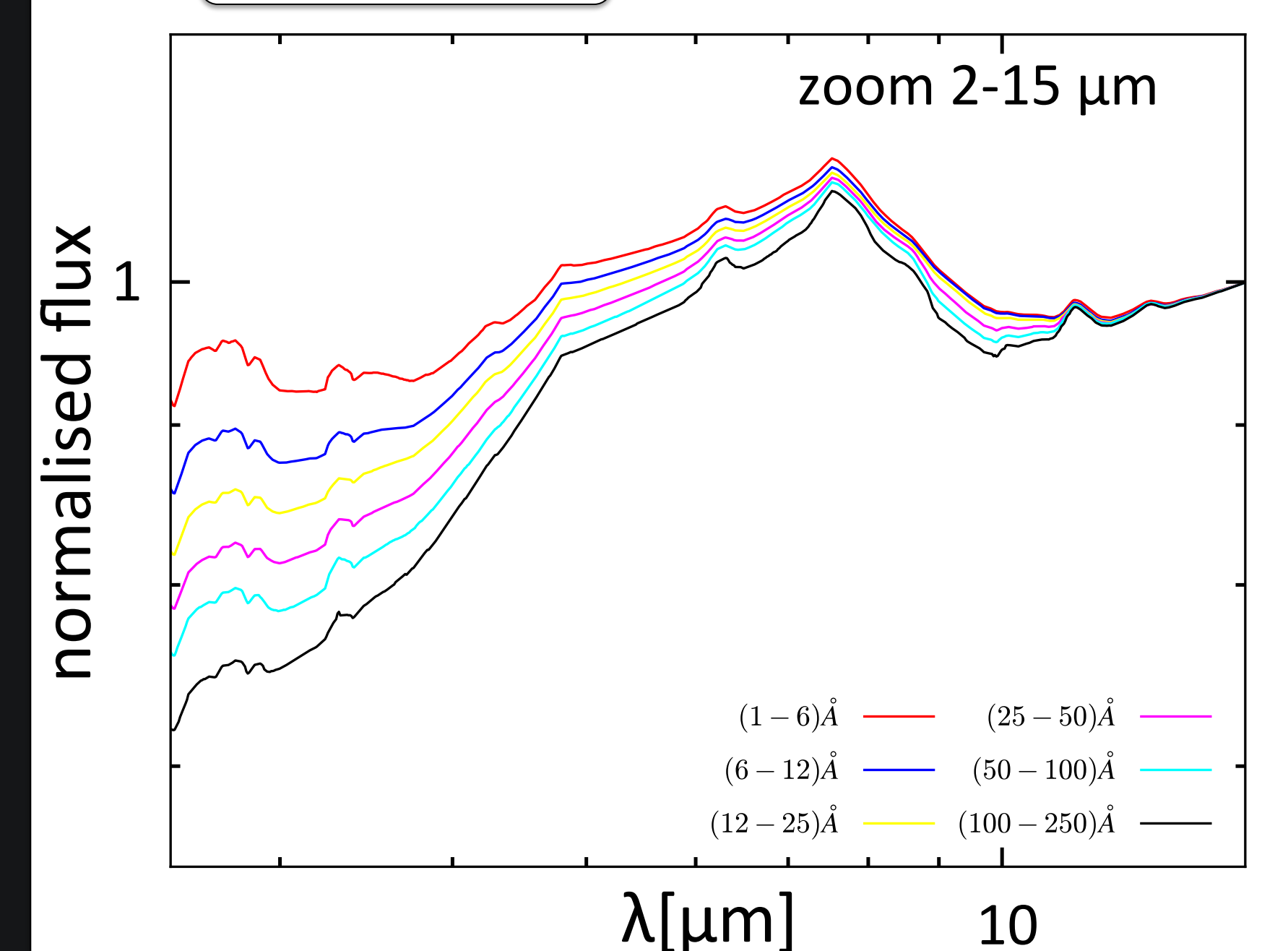
SED stacking for sources in each EW[OIII] bin (in the same fashion of the one performed for optical spectra), realised after flux normalisation to a reference frequency ($\log \nu = 13.3 \rightarrow \lambda \sim 15 \mu\text{m}$)



The behaviour of the IR SED as a function of EW[OIII] is that expected from the emission of a torus when the line of sight intercepts the torus from a *face-on* to an *edge-on* position, in agreement with the theoretical models by Nenkova et al. 2008. Moreover, the fact that we observed Broad Emission Lines even in AGN in positions close to the edge-on suggests that the torus is clumpy.



Torus



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