

The Subarcsecond View of Active Galactic Nuclei. IV. The L - and M -band Imaging Atlas

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Motivation

Dusty Torus

LM probe **intermediate** AGN scales

between **sublimation ring** (*K*) and **extended dust** (*N*)

Polar wind “launch” zone

VLT/MATISSE

JWST NIR instruments

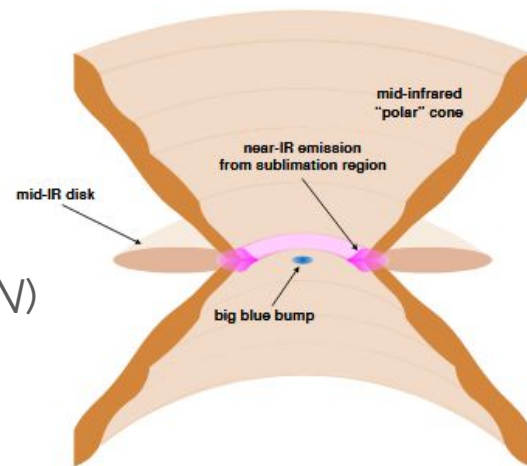


Figure 1. Schematic view of the pc-scale AGN infrared emission consisting of a geometrically-thin disk in the equatorial plane (light brown) and a hollow dusty cone towards the polar region (dark brown). The inner part of the disk (pink) emits the near-IR emission dominating the 3 – 5 μm bump. Hönic+2019

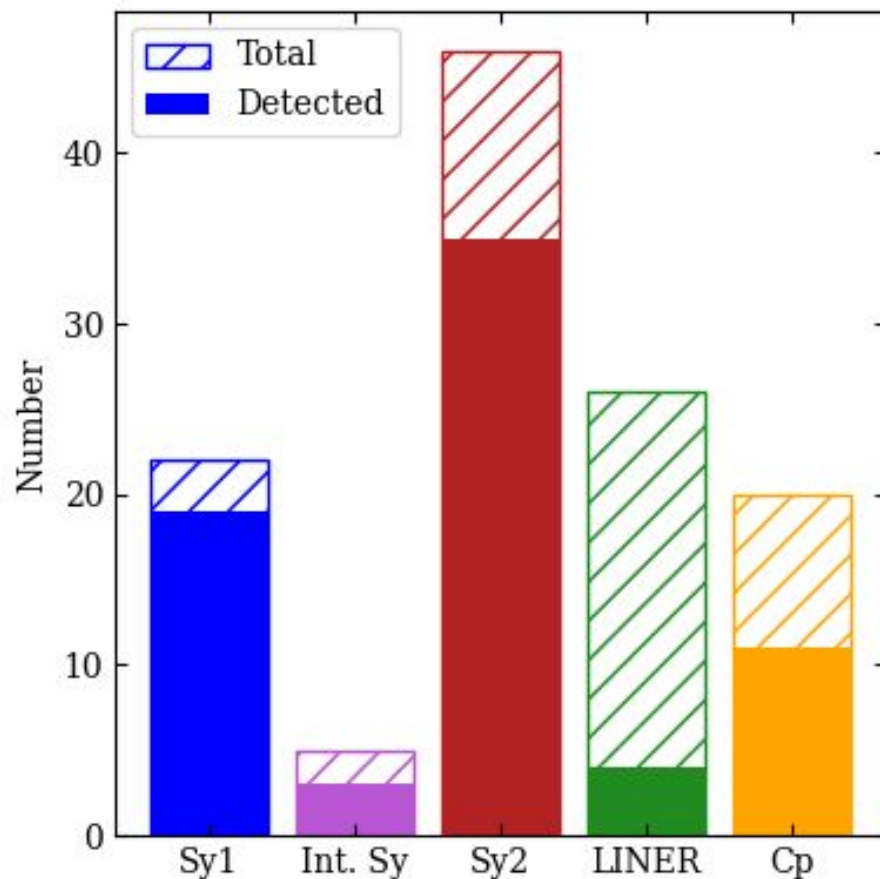
The Catalog

119 Local AGN ($z < 0.3$)

- Sy1, Int. Sy, Sy2, LINERs, Composite
- Parent sample: Asmus+2014
 - Subarcsec. *N*-band
- VLT-ISAAC (archival) data from 2000-2013

Spatially Decomposed Fluxes

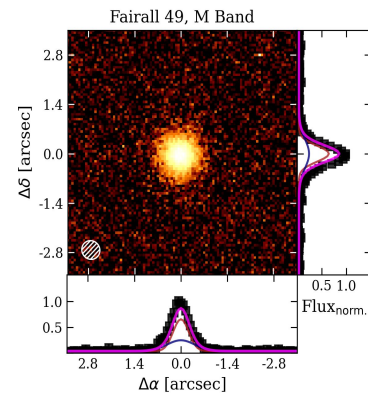
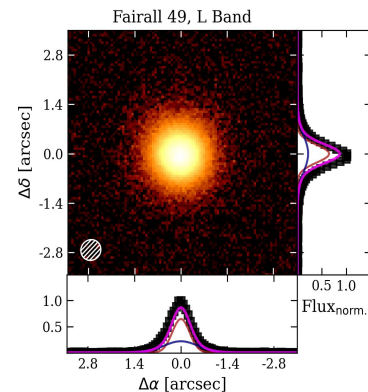
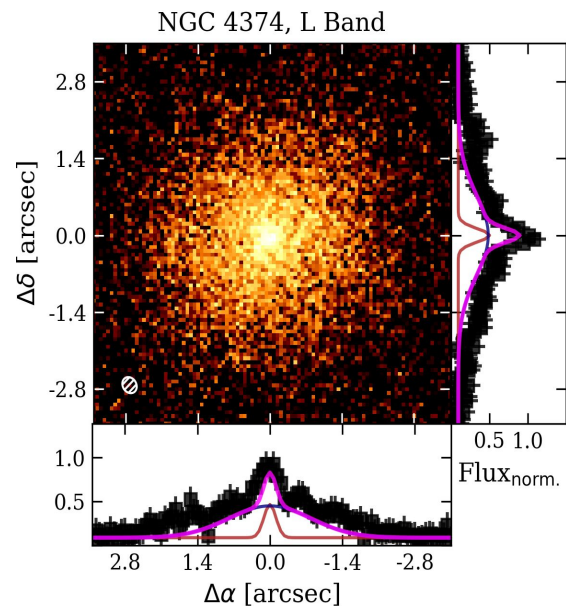
- Central, unresolved component
- Resolved emission



Flux Fitting

1. Estimate PSF from star observed close in time
2. Fit 2 Gaussians simultaneously
 - a. 1 is fixed to PSF
 - b. 1 is larger than PSF

For the rest of the talk we'll consider the **unresolved component**: the dusty torus



Conversions from *WISE*

ALLWISE AGN has 10^6 sources!

We can't use *WISE* fluxes directly for VLTI

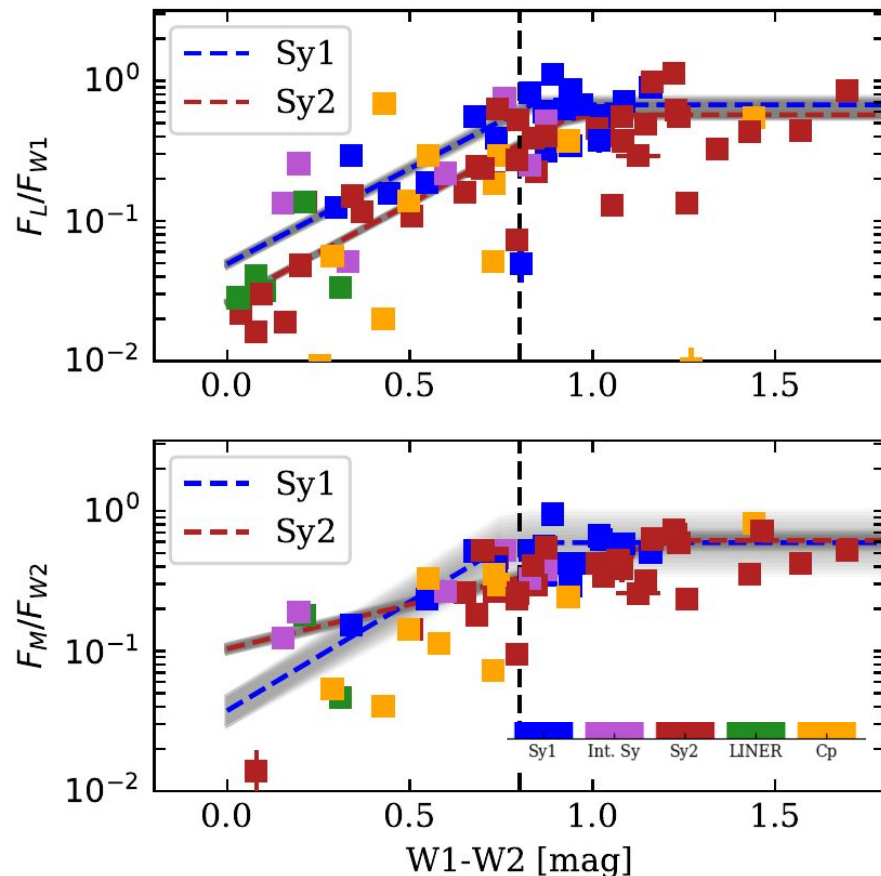
Photometry within 6''

Extended region is unresolved

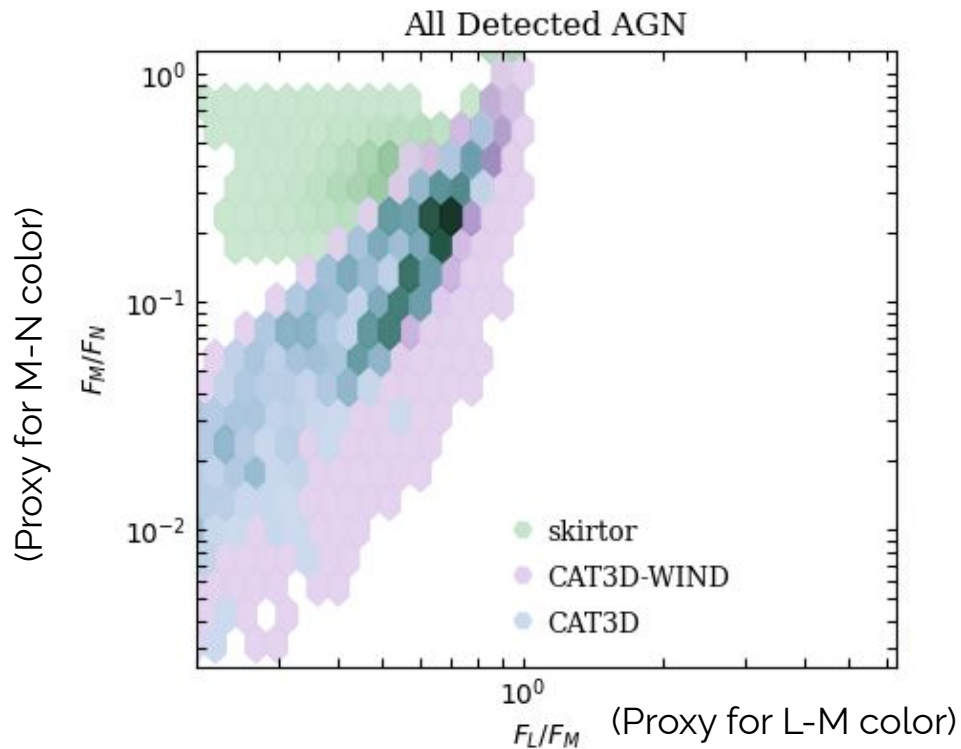
We compare *WISE* *W1* and *W2* to ISAAC

Gives estimate of flux at the VLTI

Constant ratio when $W1-W2 > 0.8$

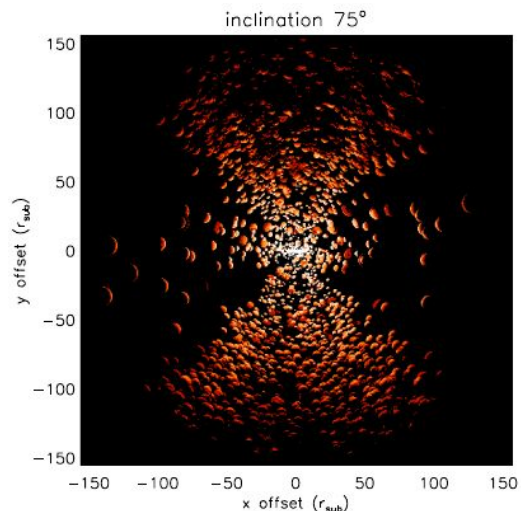


Dusty Torus Models



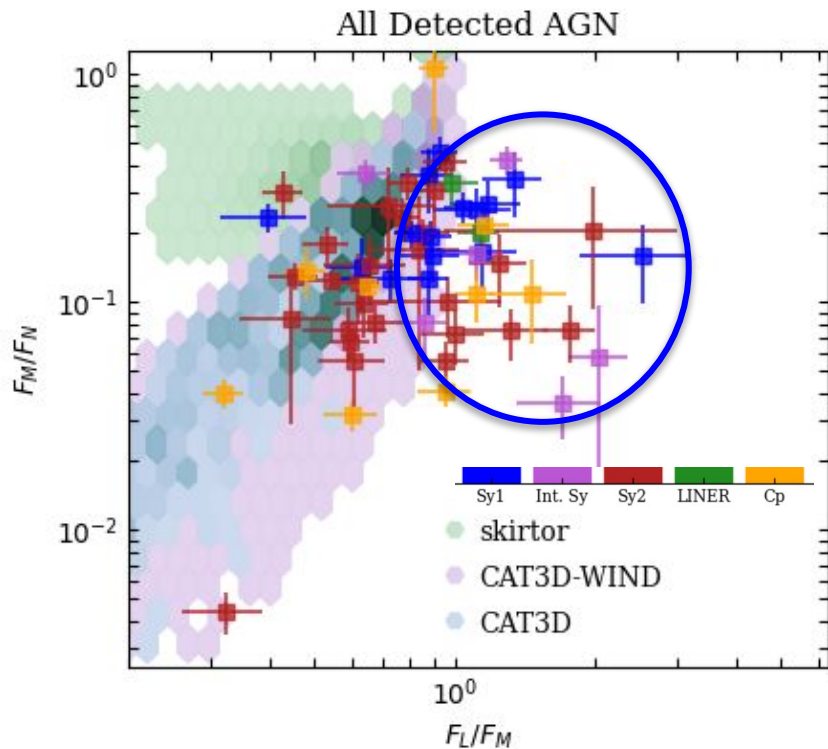
SKIRTOR (Stalevski+2016) is two-phase

CAT3D (Hönig+2010) and CAT3D-WIND (Hönig+2017) use collections of dust clouds



CAT3D-WIND
dust cloud
distribution
(Hönig+2017)

Dusty Torus Models



CAT3D-WIND matches our sample best

But why are some AGN so “blue”?

- Resolution effect?
 - Host-galaxy contamination
- 3-5 micron bump?

Stellar Contamination?

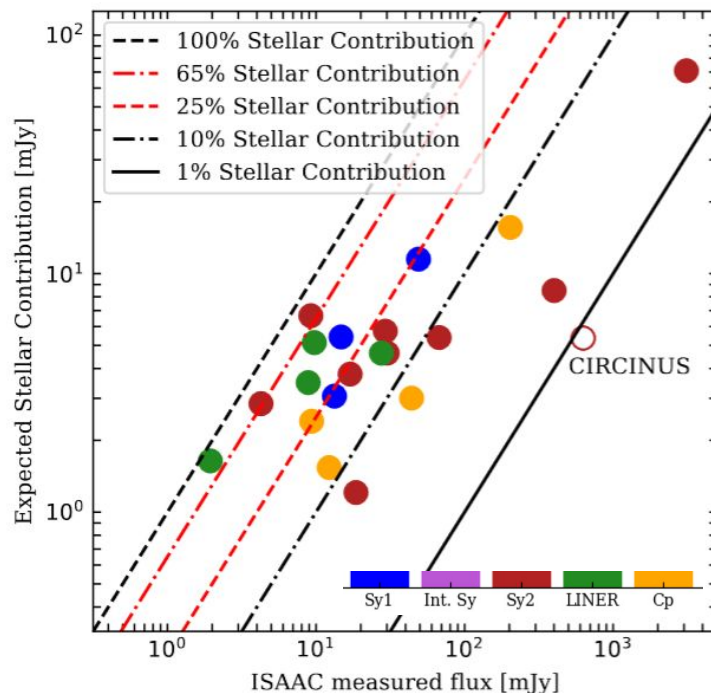
24 AGN have SINFONI K-band
measurements of central 1''
(Burtscher+2015)

Assef+2010 measured

$$K - L = 0.09$$

for old stellar populations in the bulge

=> Can estimate the L stellar contribution
from the bulge



Stellar Contamination!

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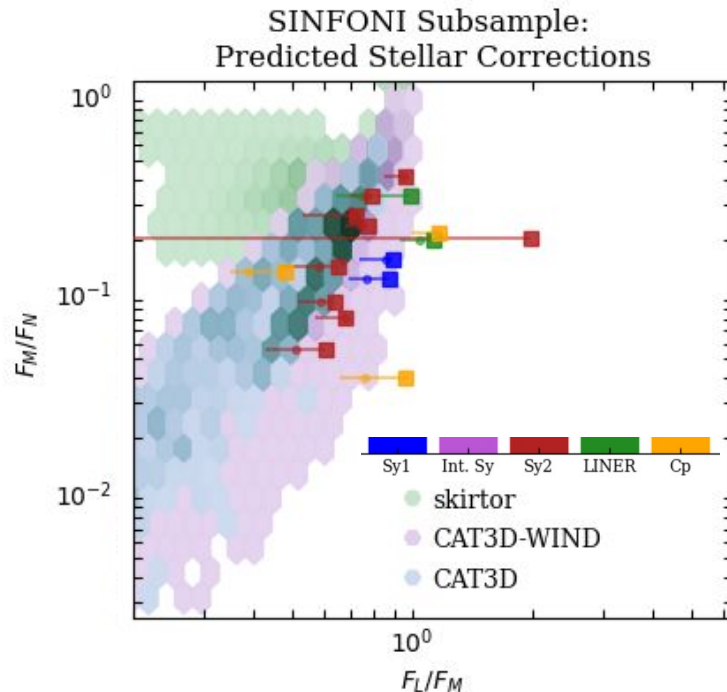
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All x-matched AGN become consistent with CAT3D-WIND



Take Home Messages

This is the largest existing subarcsec. *LM* flux catalog of AGN

We report separate *L* and *M* fluxes for the central engine and its surroundings

We report extensions and PA of the *LM*-band dust

We relate our fluxes to *WISE* *W1* and *W2*

“Increases” the sample from 119 to $\sim 10^6$

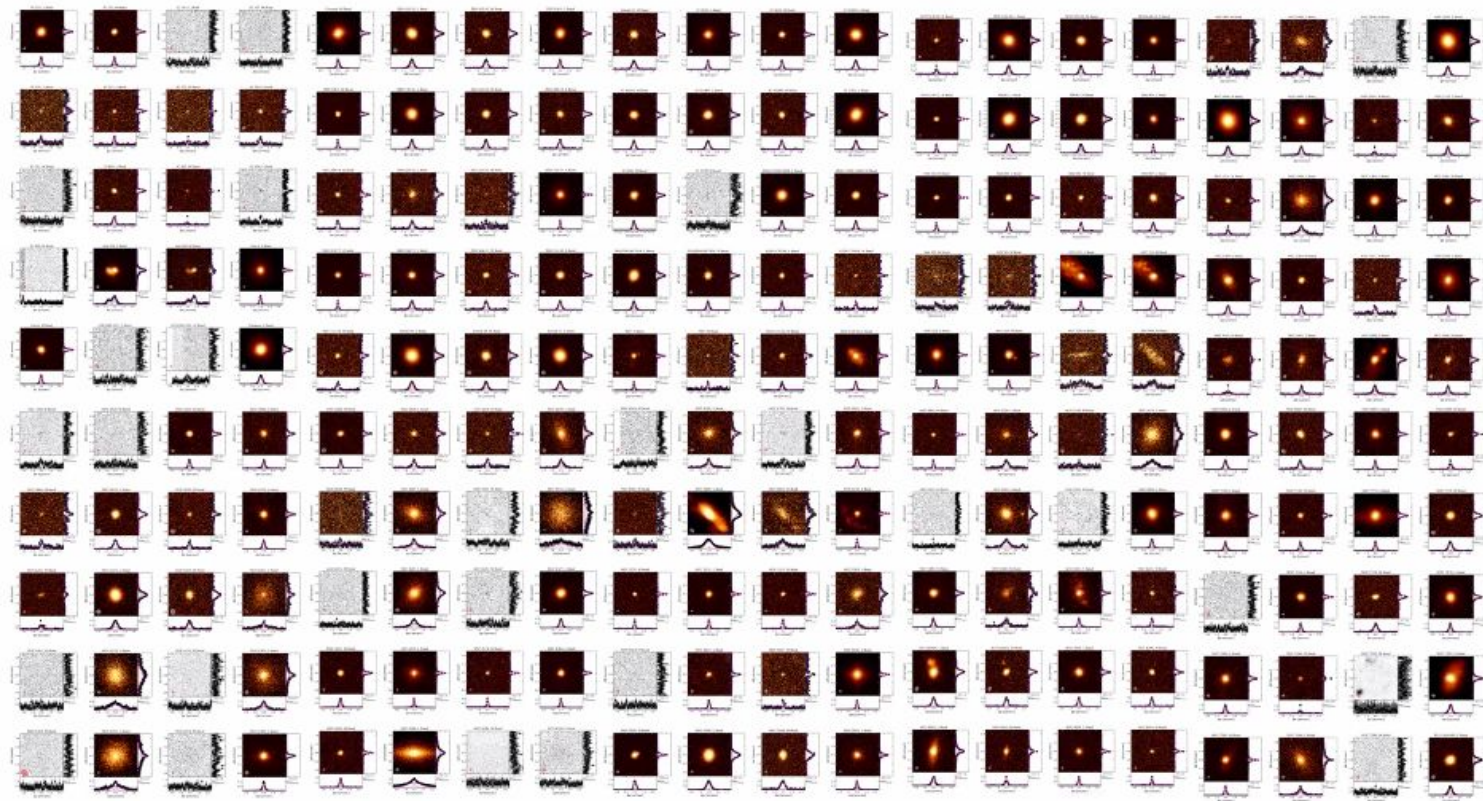
CAT3D-WIND best matches our measured L-M & M-N colors

Large offsets **can** be explained by stellar contamination (30% on avg in *L*)

Interferometric follow-up necessary to be certain

Paper in review, so please keep an eye on the ArXiv

Thanks!



Bonus Slides

