

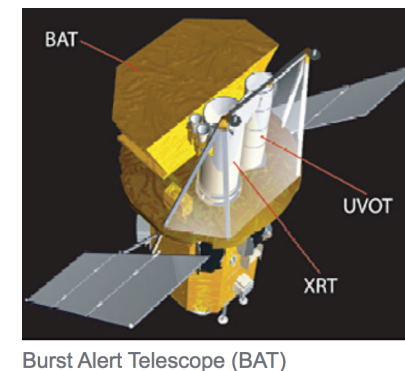
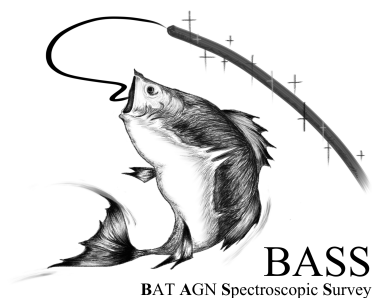
The nature of the most luminous obscured AGN in the low-redshift universe

Rudolf Bär

ETH Zurich

BASS meeting Gainesville, February 2019

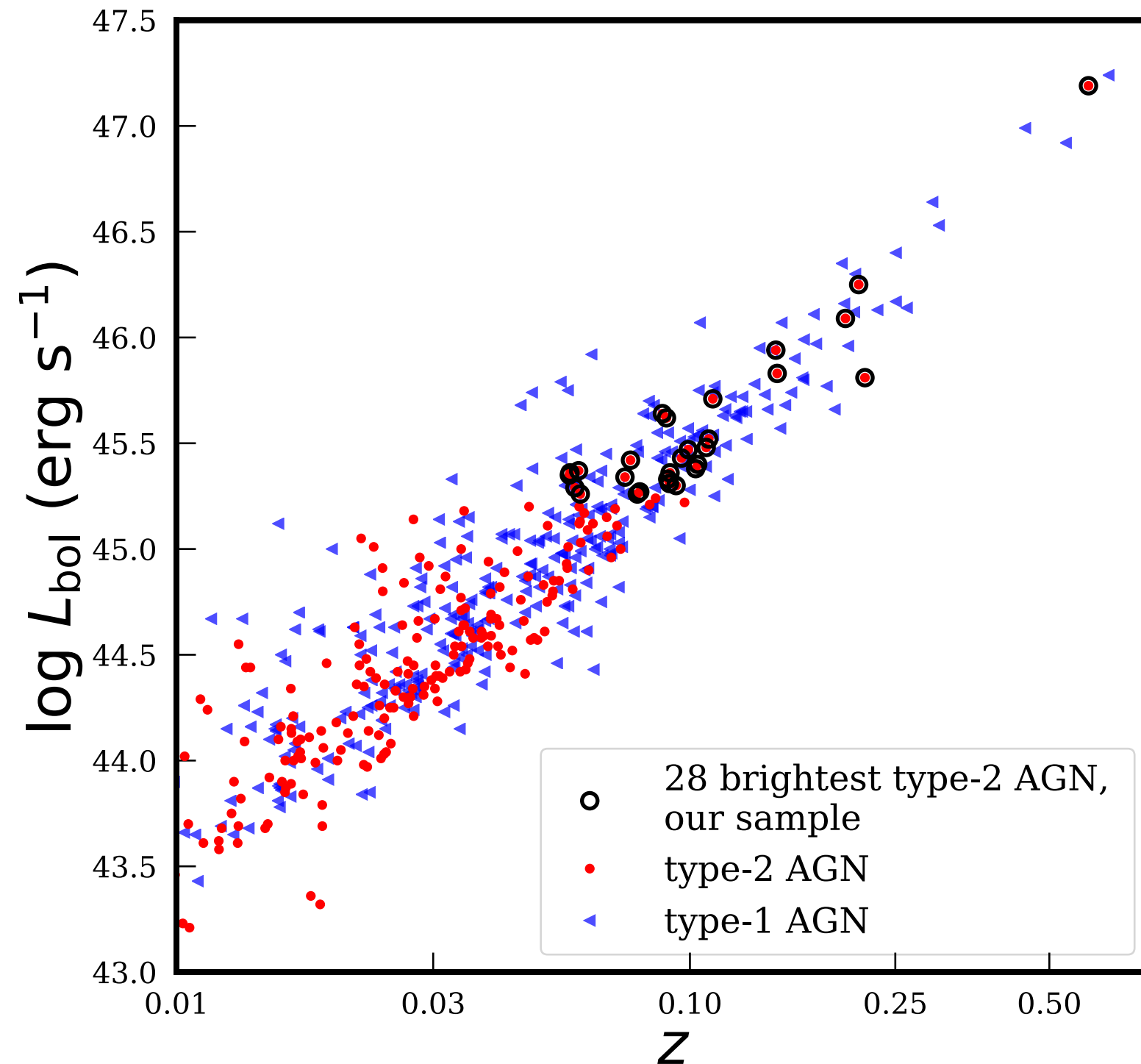
with Benny Trakhtenbrot^{2;3}, Kyuseok Oh⁴, Michael J. Koss⁵, O. Ivy Wong⁶, Claudio Ricci^{7;8;9}, Kevin Schawinski¹, Anna K. Weigel¹, Lia F. Sartori¹, Kohei Ichikawa^{10;11}, Nathan J. Secrest¹², Daniel Stern¹³, Fabio Pacucci¹⁴, Richard Mushotzky¹⁵, Meredith C. Powell¹⁴, Federica Ricci^{16;17}, Krista L. Smith¹⁸, Isabella Lamperti¹⁹, and C. Megan Urry¹⁴



Analysis of the 28 most luminous obscured Type 2 AGN of BASS/DR1

**Are they just very luminous or do they have
common characteristics as a group?**

Sample selection



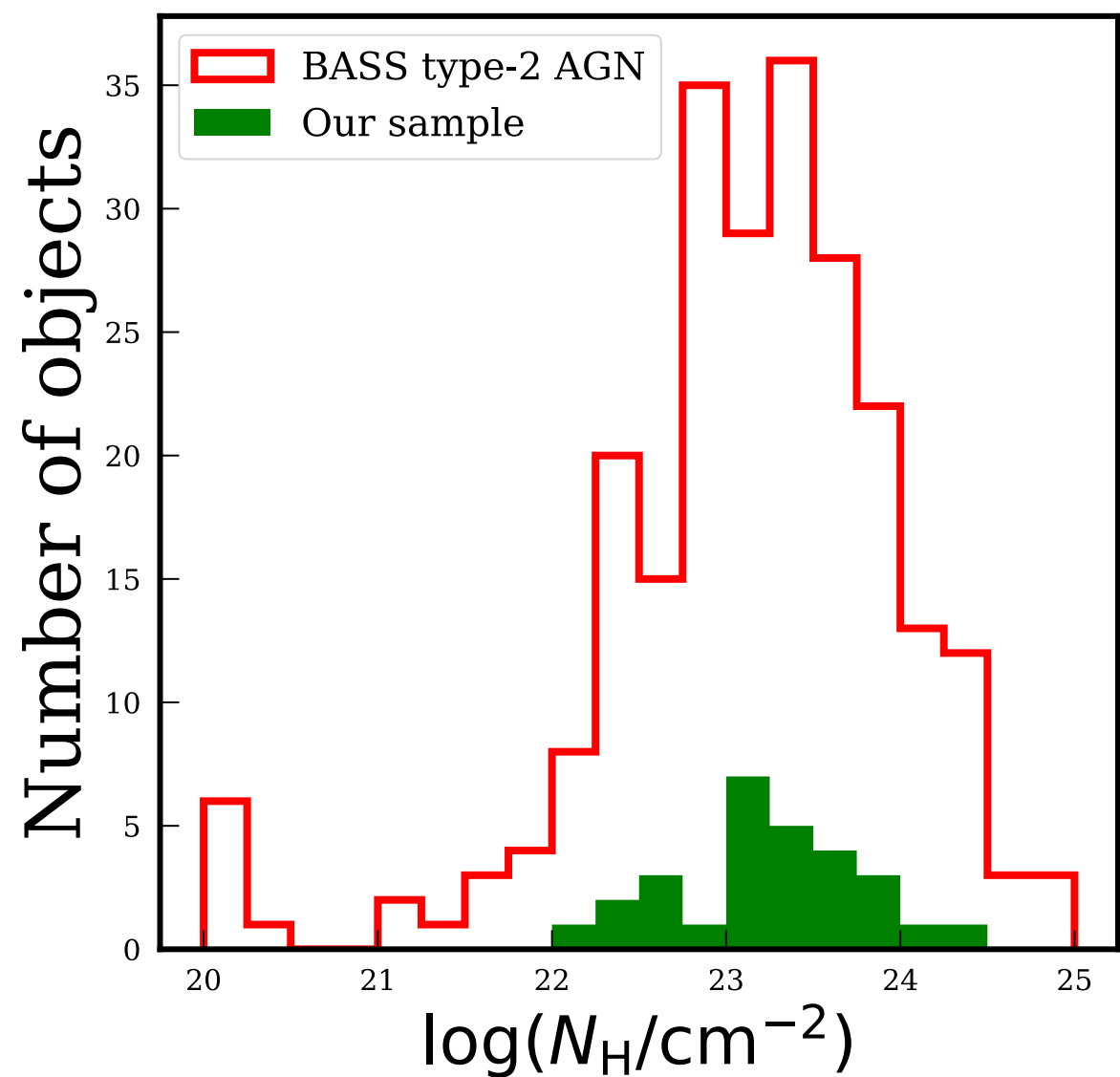
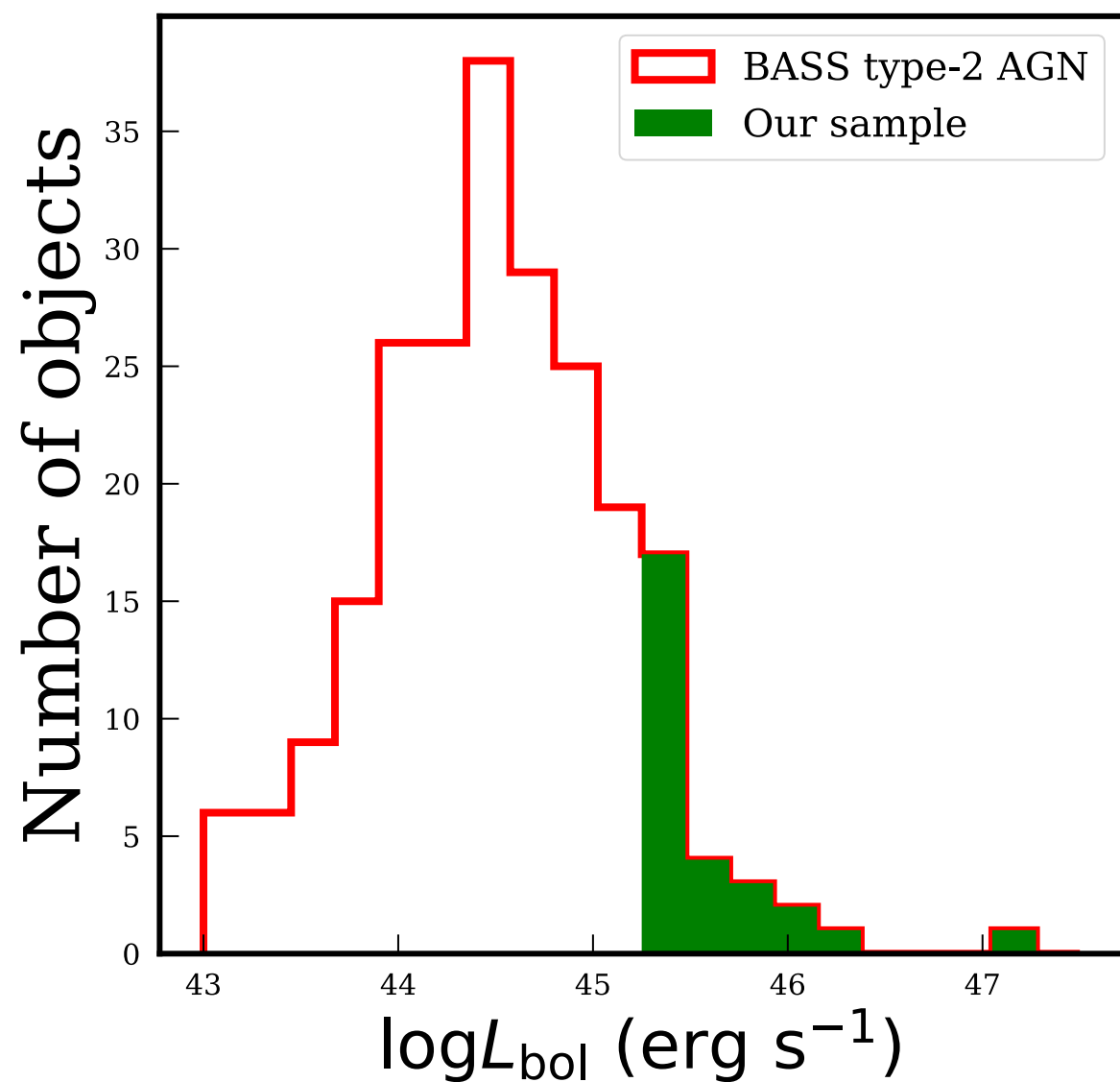
no broad lines

No Blazars

$|b^0| > \text{galactic plane}$

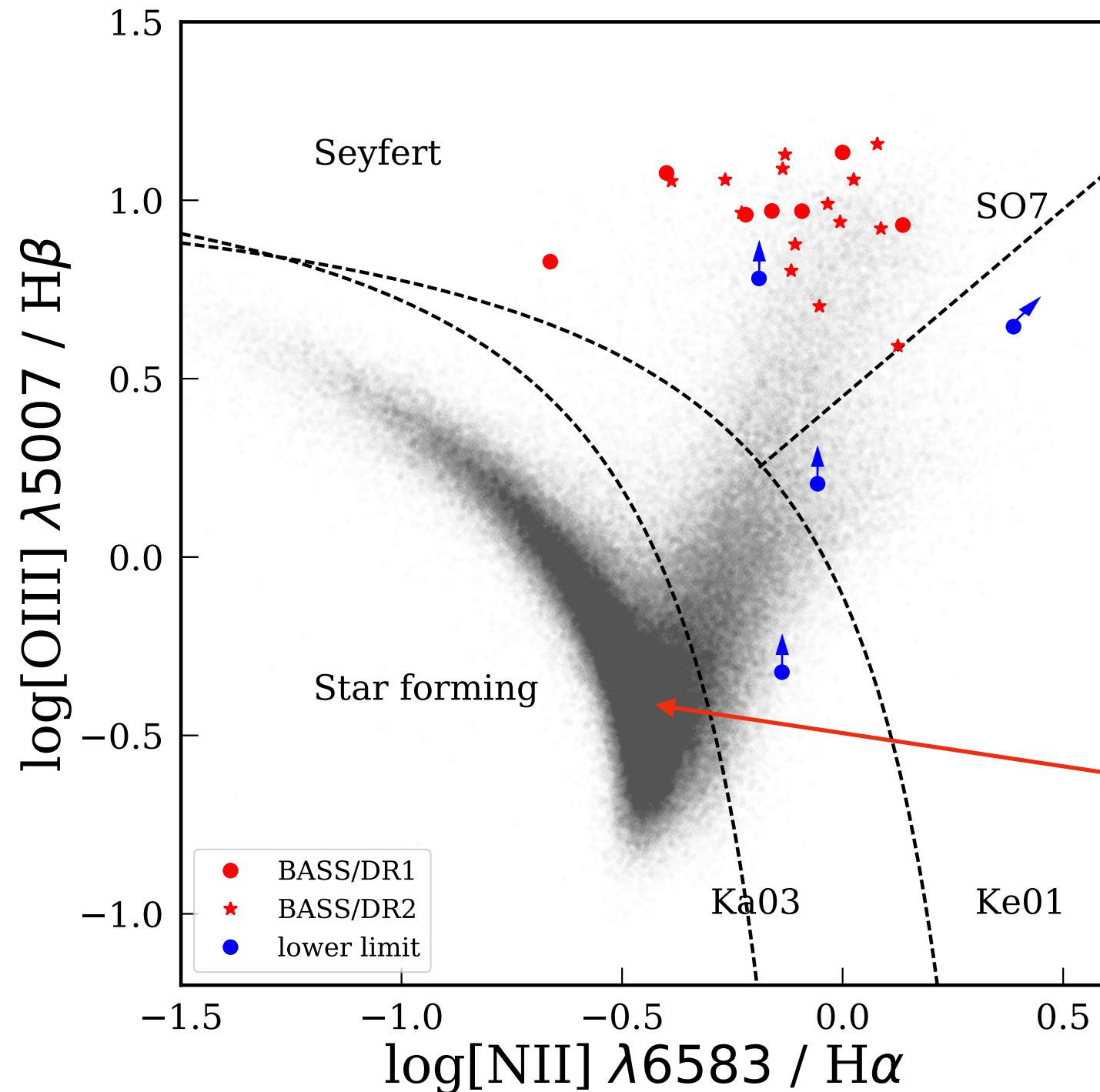
Black hole masses
initially only 10 of 28

Comparison $\log L_{\text{bol}}$ & $\log N_{\text{H}}$



—>compton thick

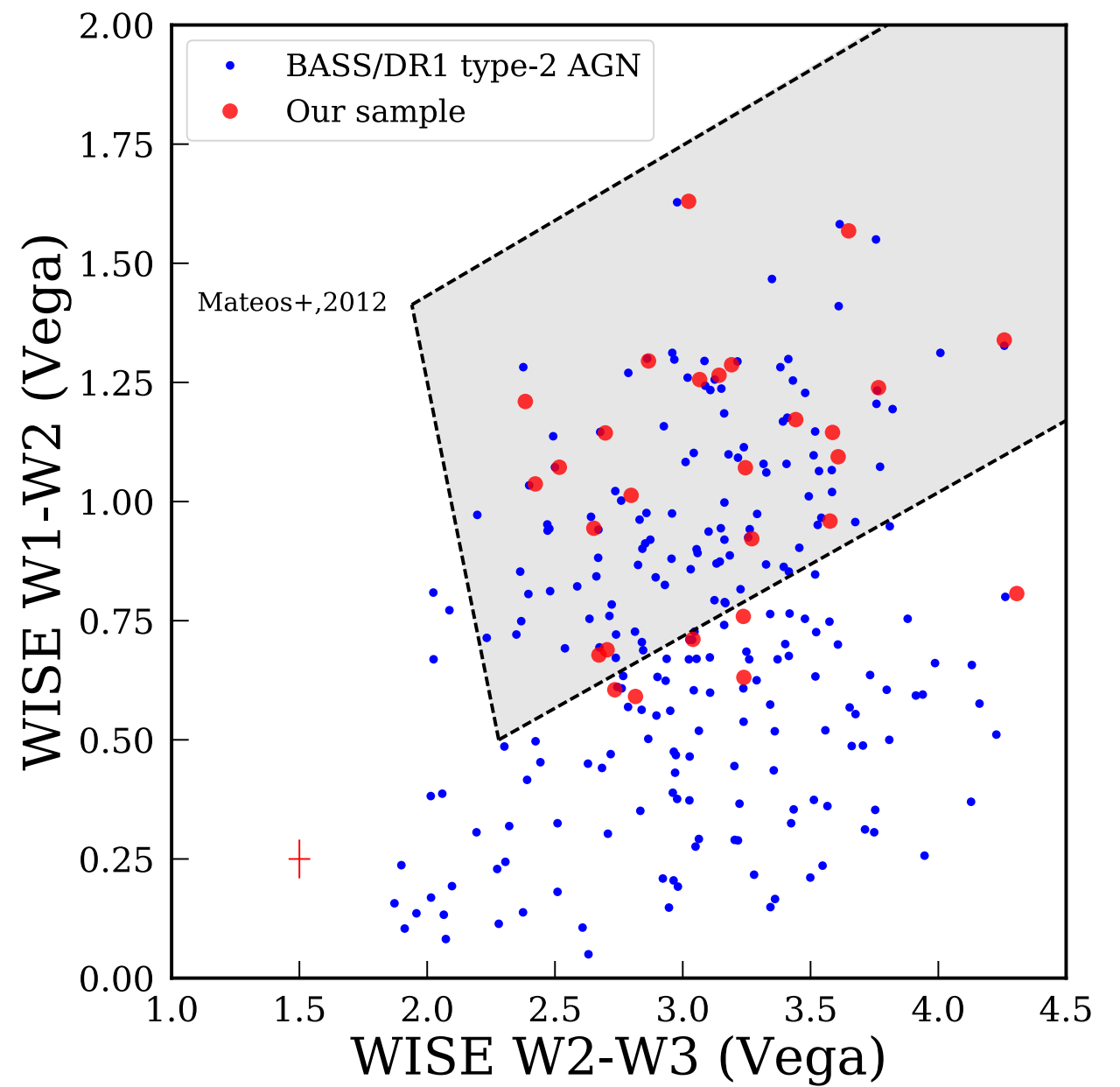
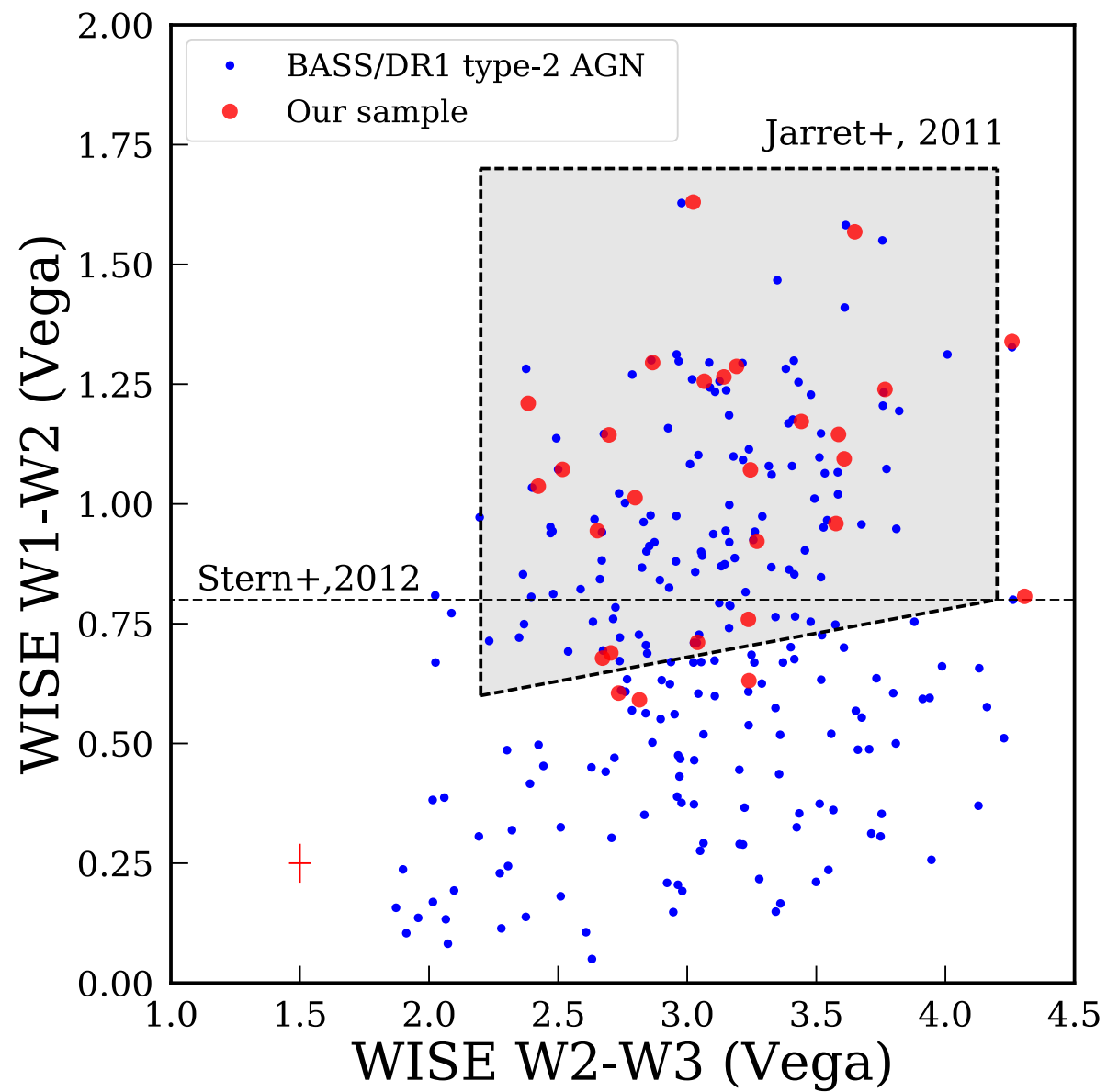
BPT Diagram



Clear classification
as AGN \rightarrow 21 of 28
4 with upper limits
but consistent with AGN

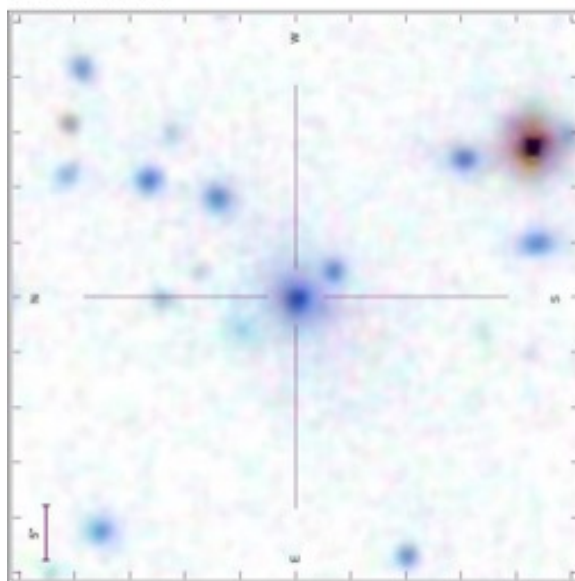
Total SDSS population
 $0 < z < 0.1$

WISE Analysis

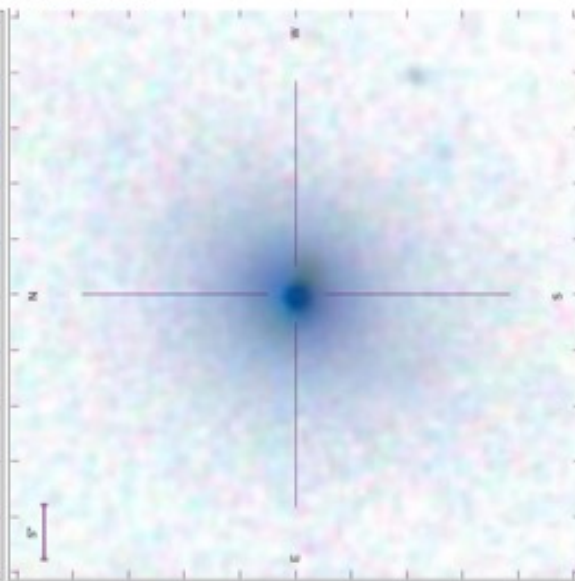


IMAGES: SDDS

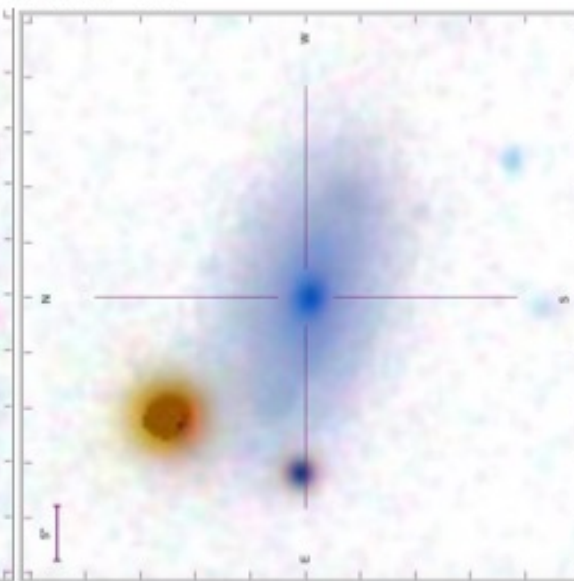
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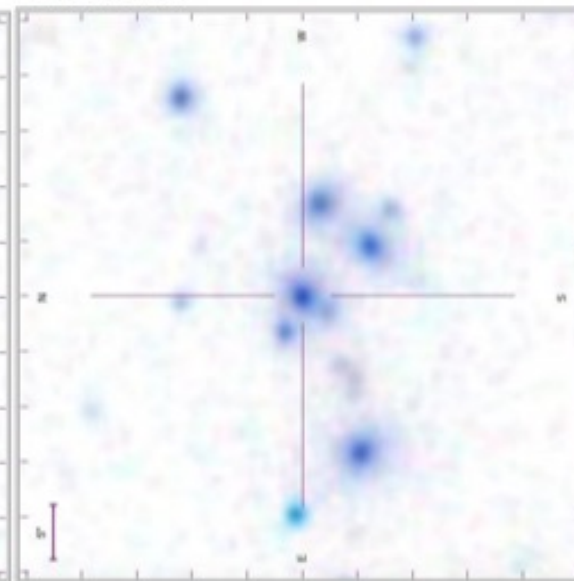
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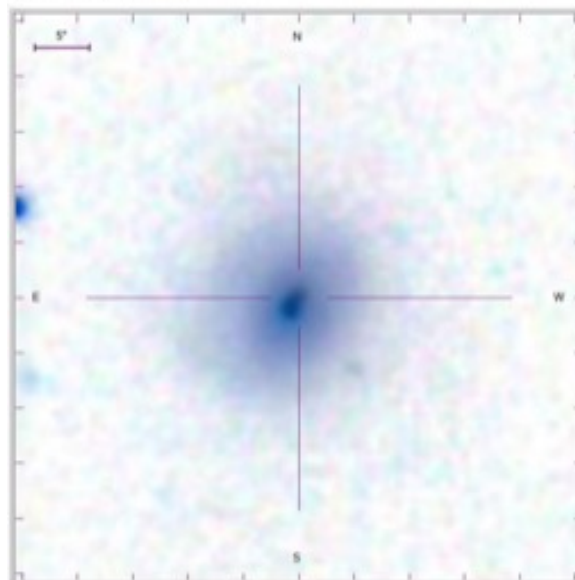
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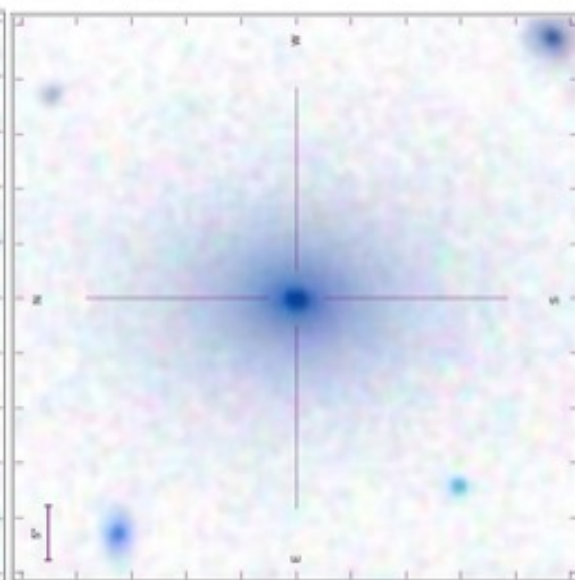
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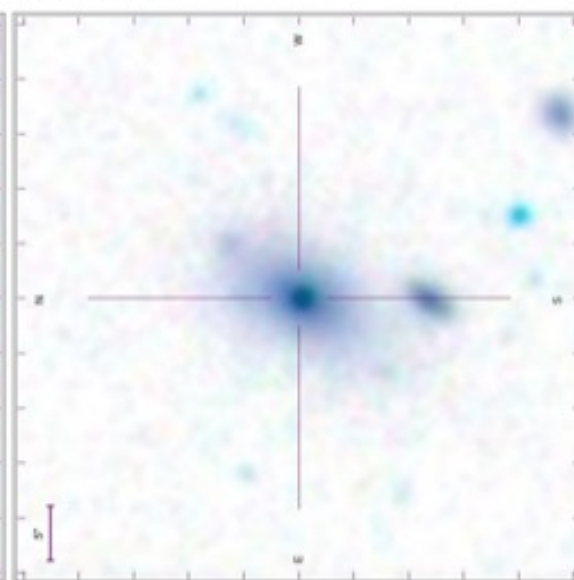
BAT ID 591



BAT ID 648



BAT ID 842

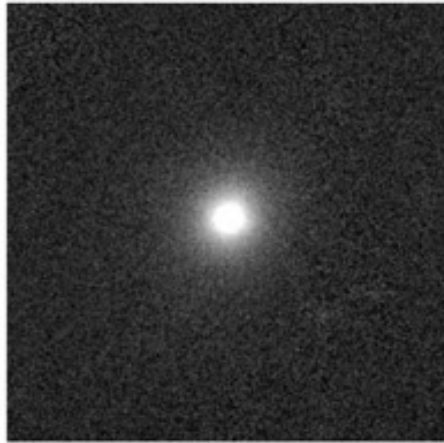


50 arcsec

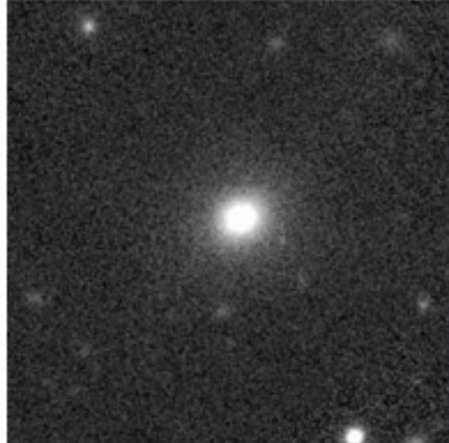


IMAGES: PanSTARRS

BAT ID 57



BAT ID 118



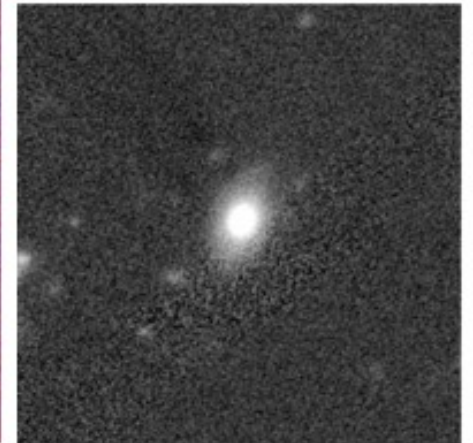
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BAT ID 179



BAT ID 203



BAT ID 238



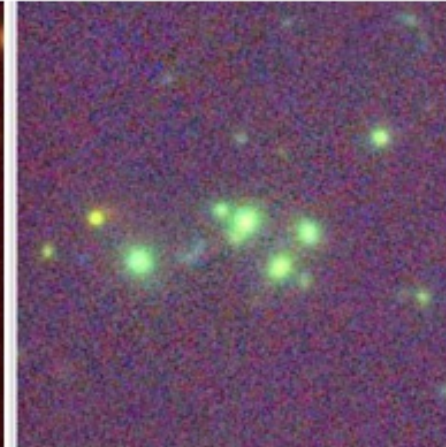
BAT ID 249



BAT ID 303



BAT ID 555



BAT ID 591



BAT ID 648



BAT ID 842



BAT ID 968



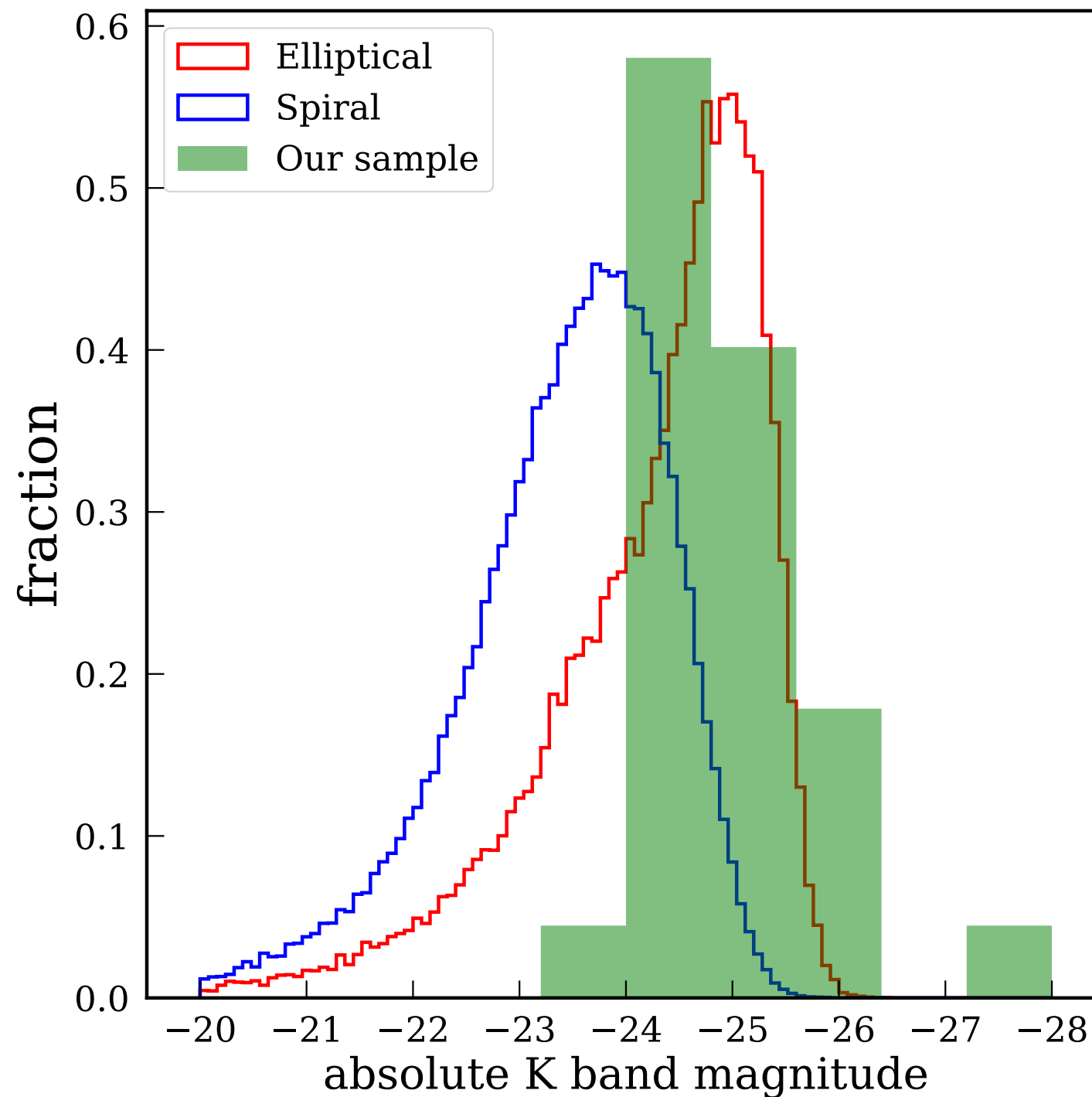
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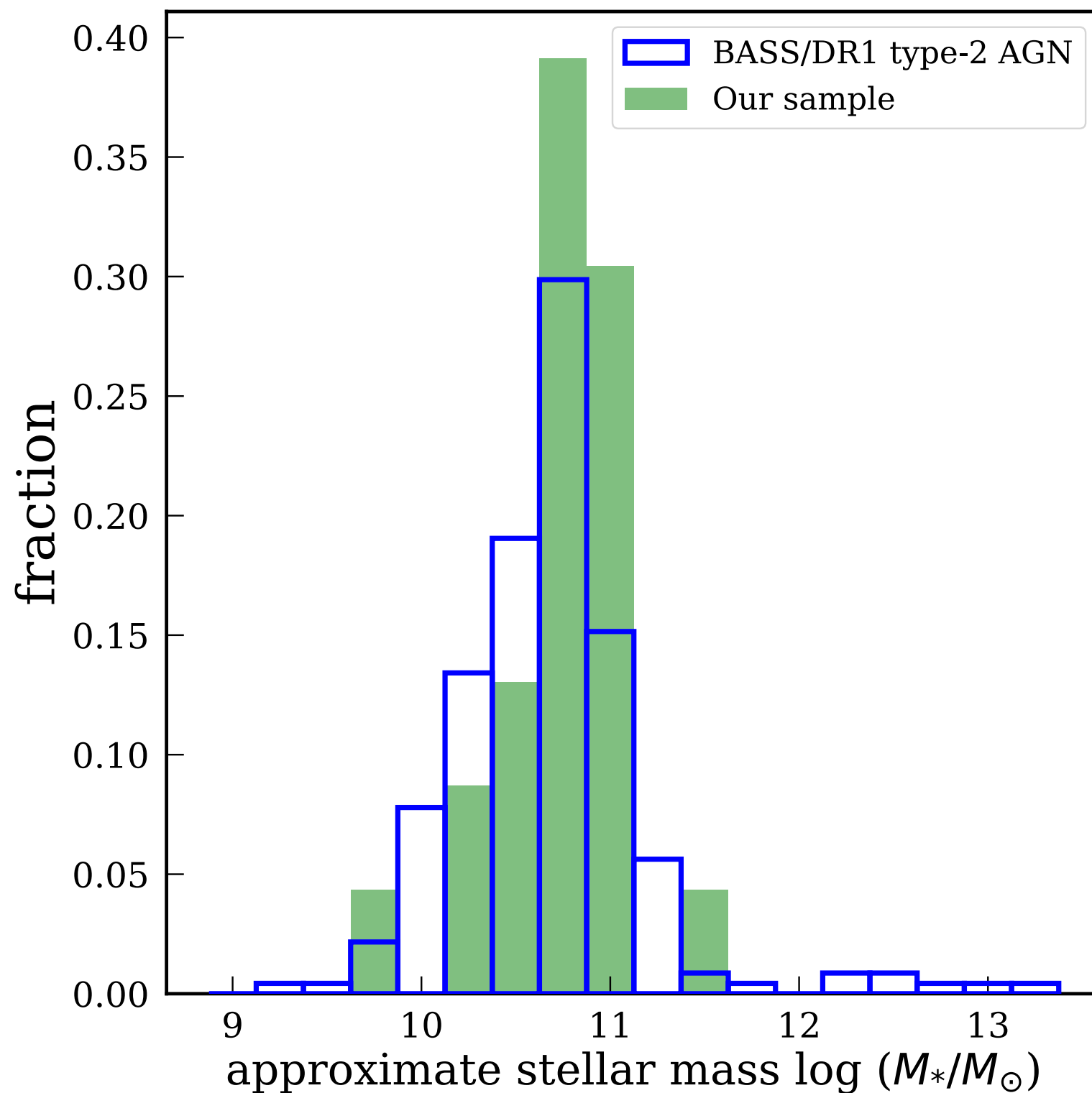
1 arcmin



Absolute K band Magnitudes & Morphologies

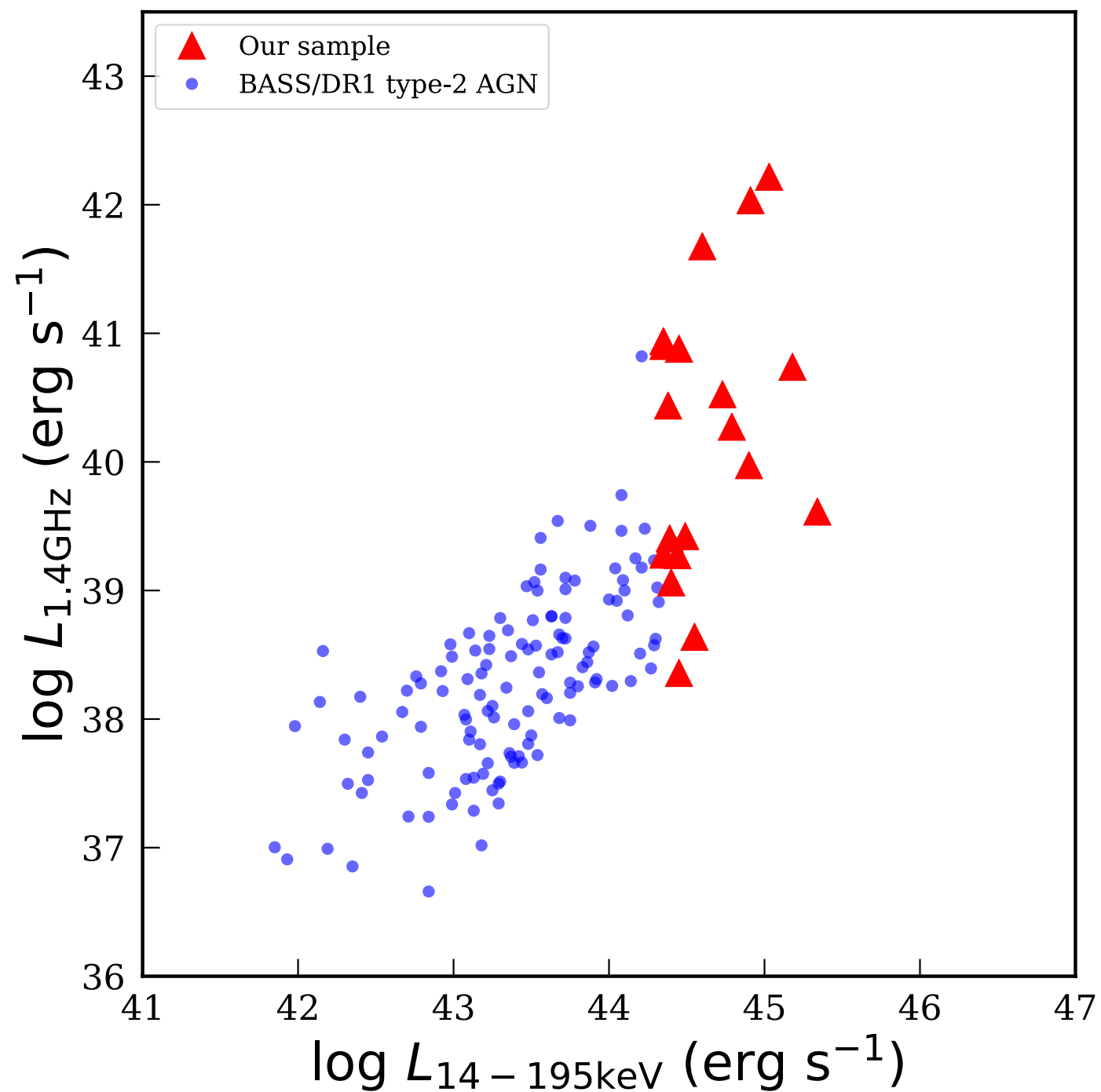


Stellar Mass

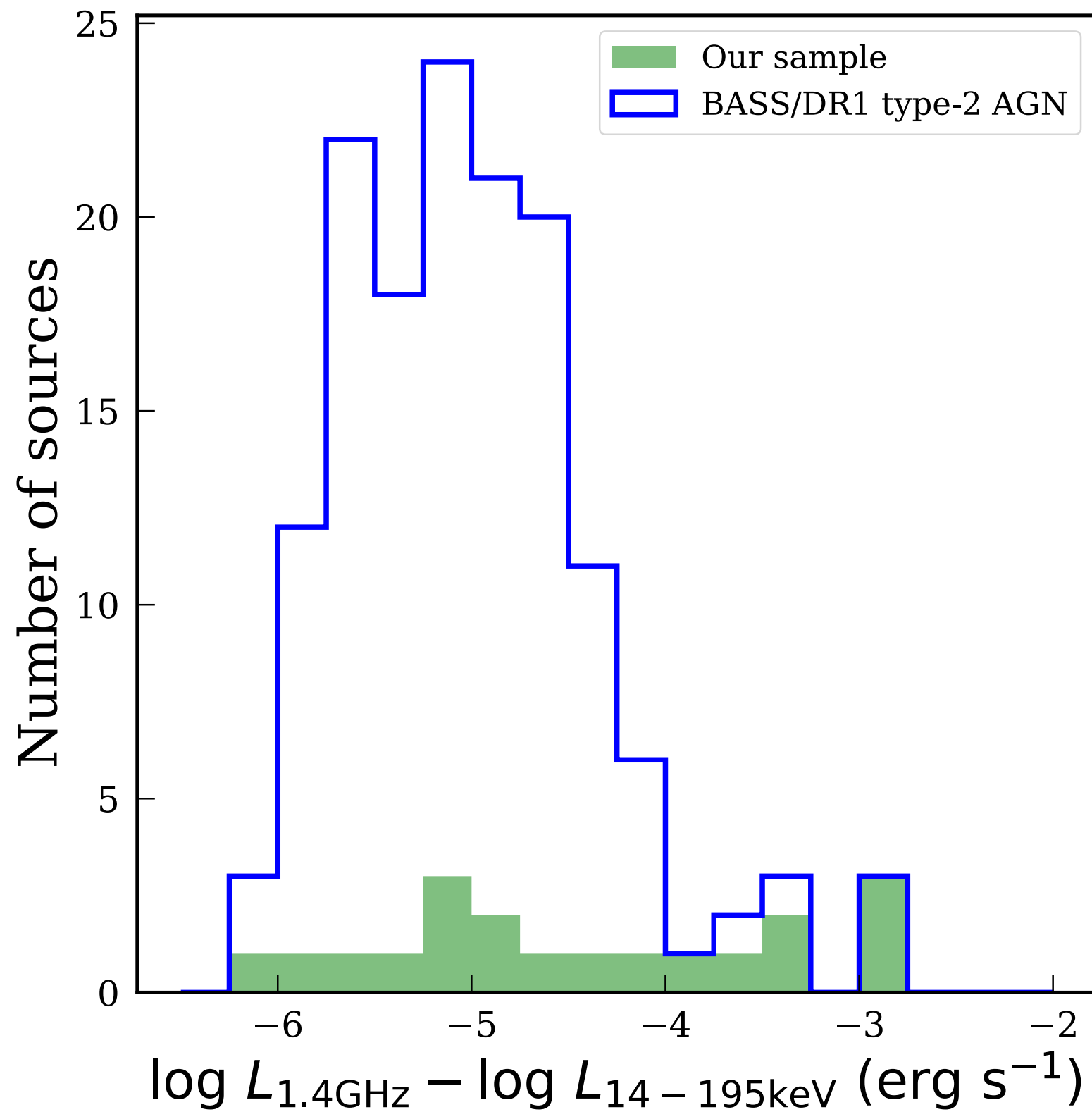


Stellar masses extend over a wide range but are skewed toward the high mass region

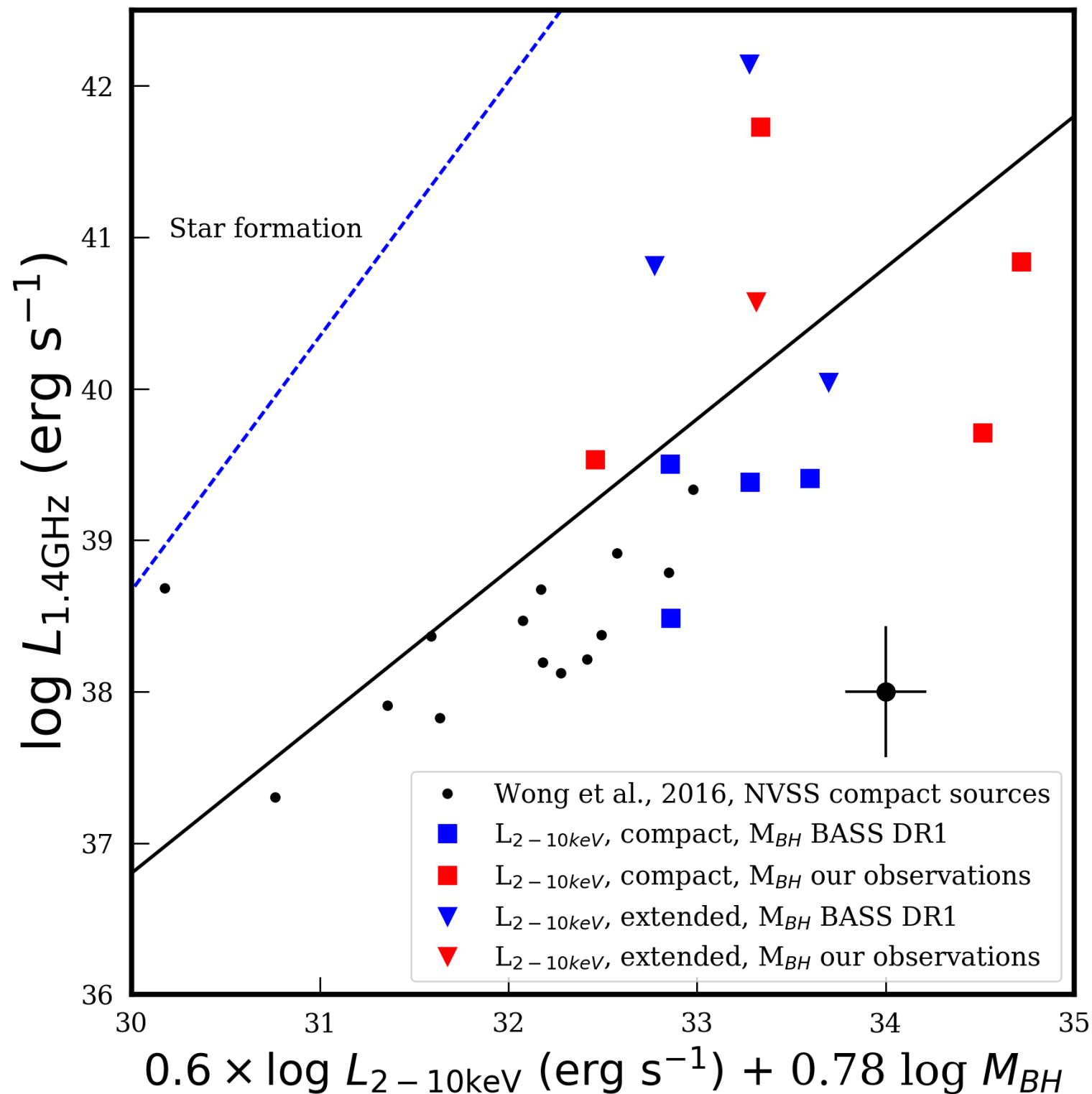
Luminosity: Radio vs Hard X-RAY



Relative Luminosity: Radio-Hard X-Ray

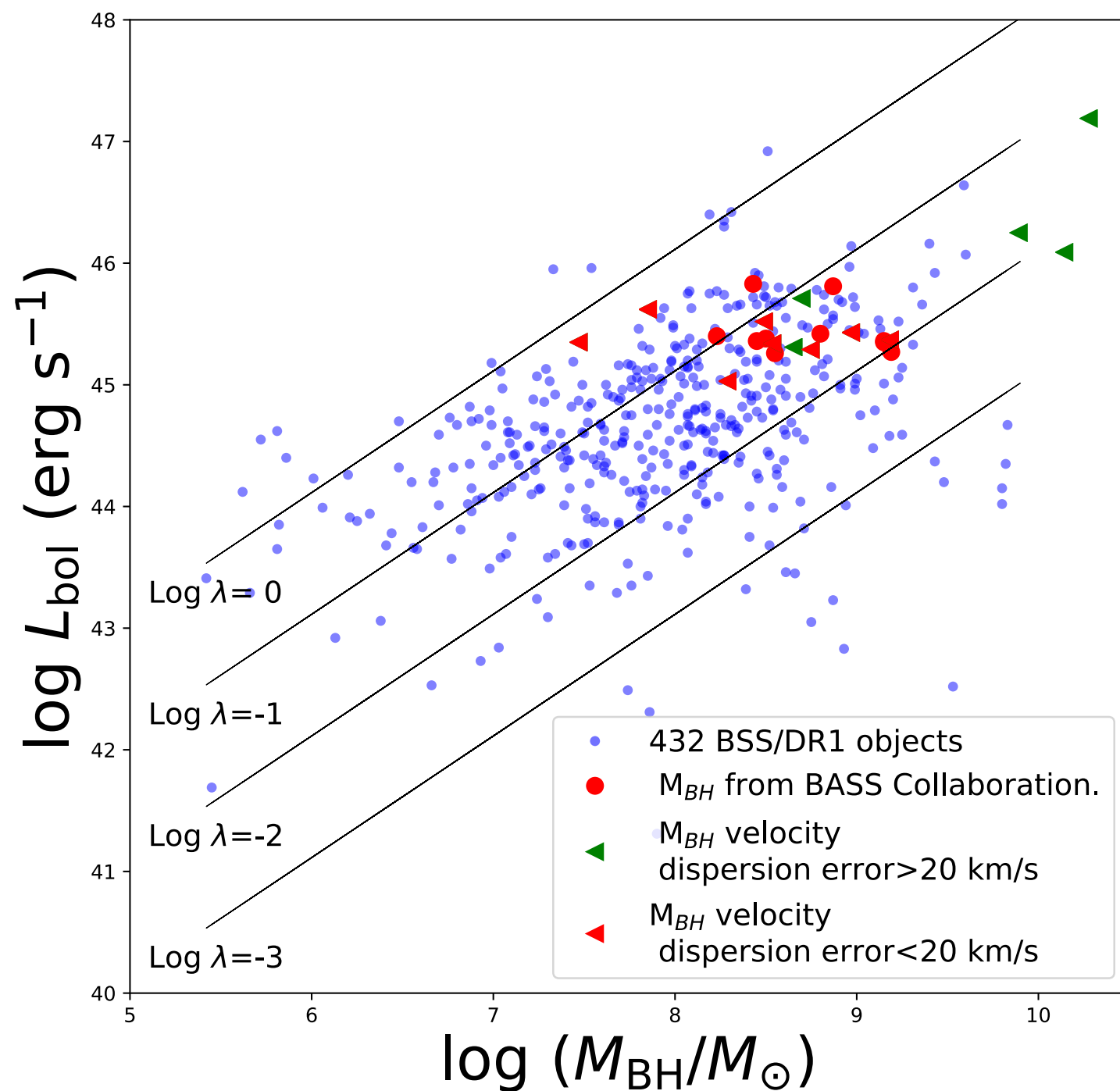


Fundamental Plane radio / X-ray

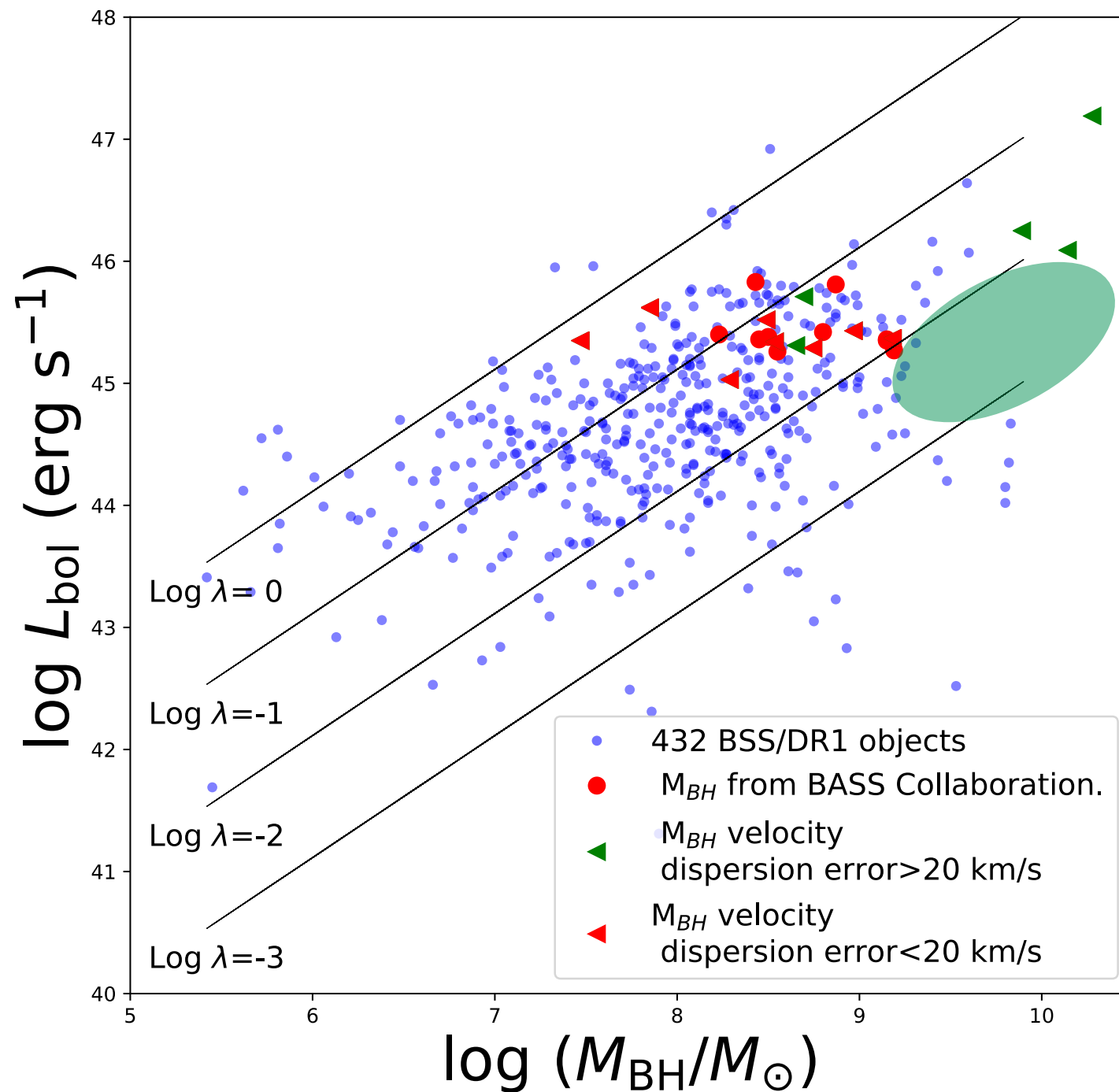


Eddington ratios

High luminosity due to \rightarrow ?



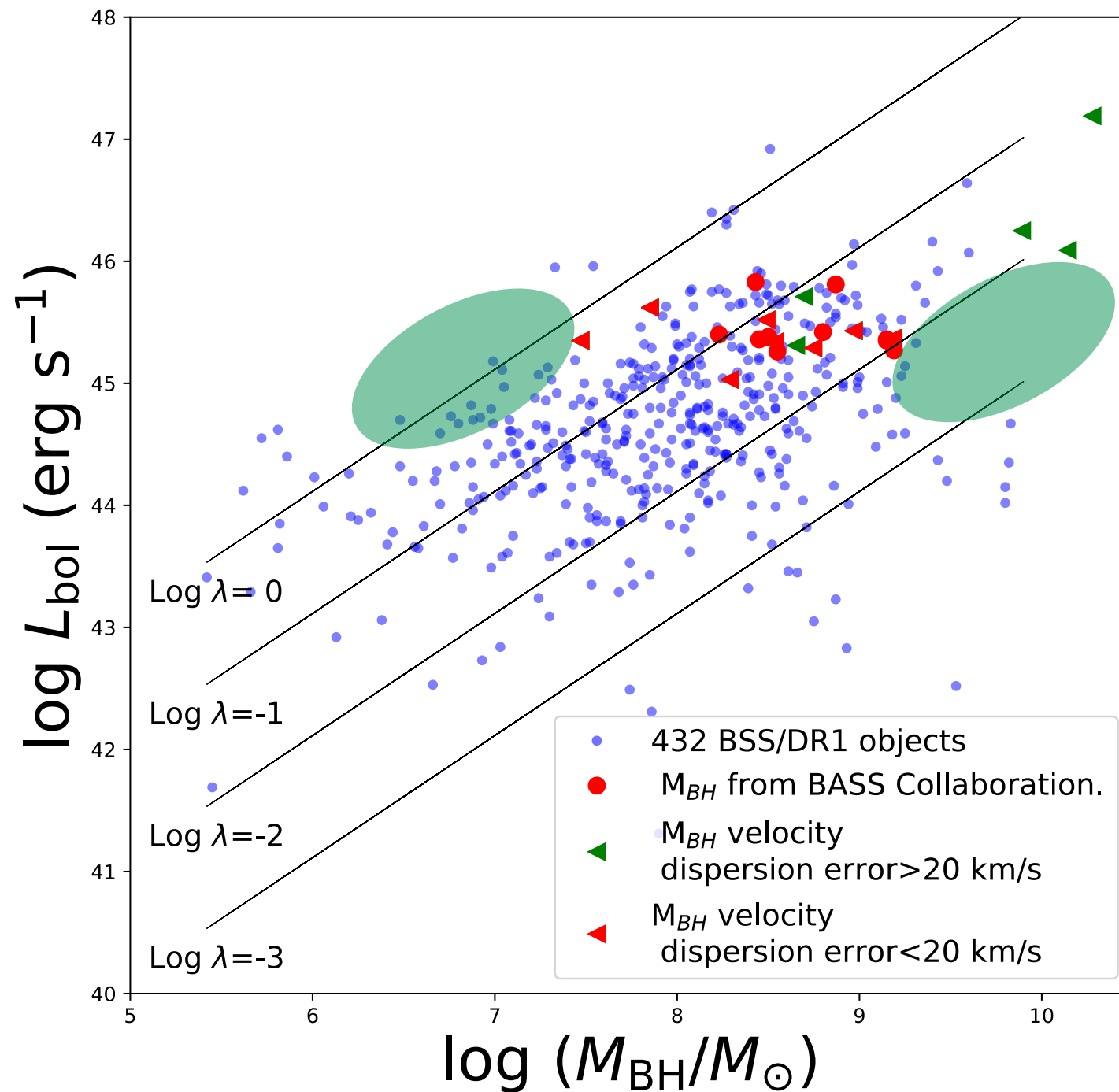
Eddington ratios



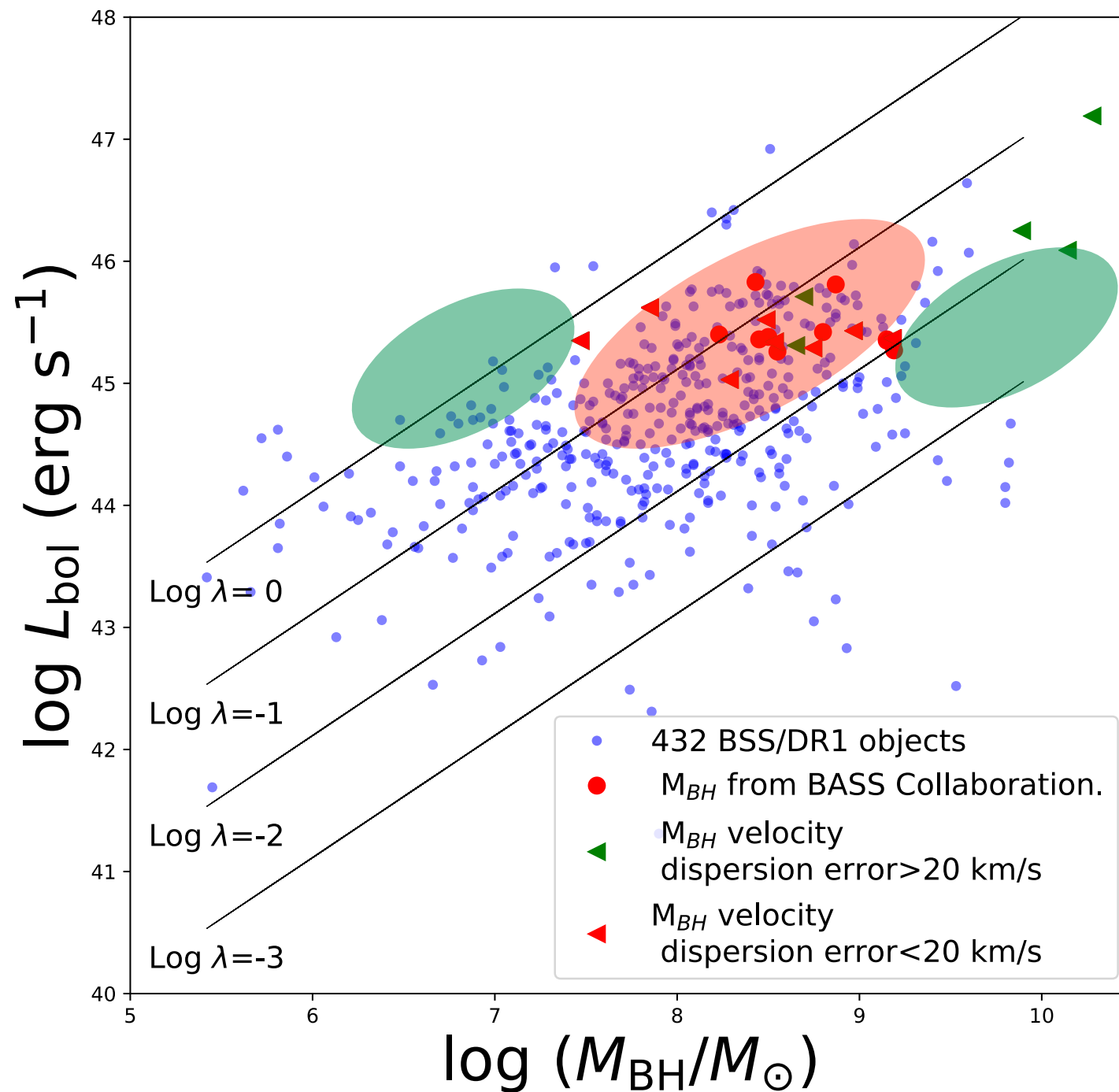
high mass low λ

Eddington ratios

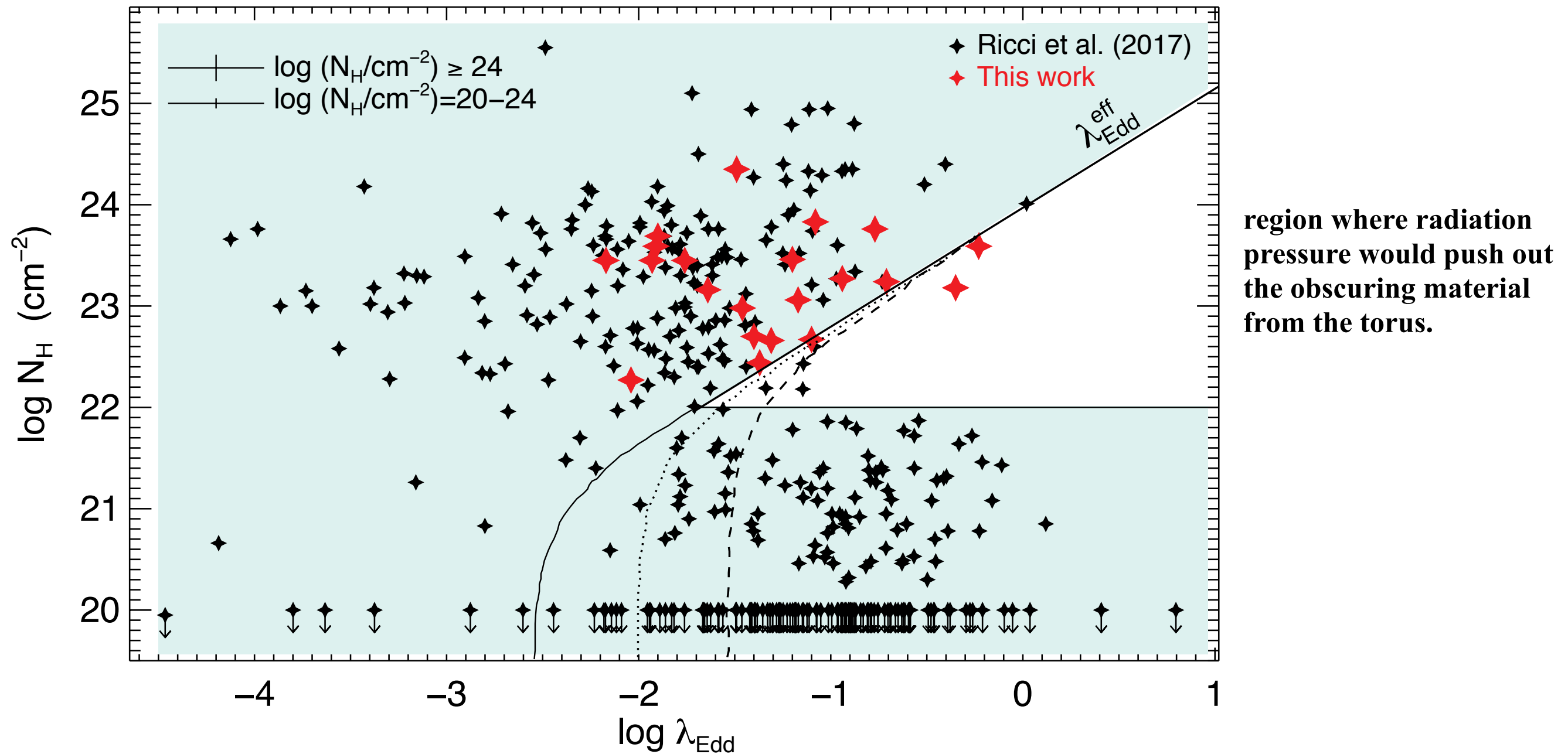
low mass high λ



Eddington ratios



Eddington ratio vs column density



Ricci et al., 2017c

Conclusions

- **The most luminous type-2 AGN of the BASS/DR1 catalog as a group do not show any common characteristics**
- **Although they have been selected purely based on hard X-rays and narrow emission lines, they are classified robustly as obscured AGN by their column densities and by optical & infrared diagnostics**

Conclusions

- **Their host galaxies are predominantly ellipticals in apparent disagreement with other studies**
- **Their host galaxies cover a wide range of stellar masses**

Conclusions

- **Their radio properties - luminosity, morphology, existence of radio lobes - are very diverse**
- **Their black hole masses cover a range of $7.5 < \log(M_{\text{BH}}/M_{\text{sol}}) < 10.3$**
- **Their accretion rates extend over wide range $-0.2 < \log \lambda_{\text{Edd}} < -2.2$**

Conclusions

- **Based on their position in the $\lambda_{\text{Edd}} - N_{\text{H}}$ plane they are compatible with the radiative feedback driven unification scenario.**

