

## **ABSTRACT**

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### **The Spitzer/IRAC look at the black hole mass - bulge properties relations**

We present for the first time a mid-infrared (MIR) investigation of the relations observed in local galaxies between the central black hole (BH) mass and host spheroid properties. The analysis is based on a bi-dimensional bulge-disk decomposition applied to the Spitzer/IRAC 3.6  $\mu$  images of 55 galaxies with reliable  $M_{\text{BH}}$  estimates. Concerning the comparison of  $M_{\text{BH}}$  with observed parameters, we find the expected tight correlation with the 3.6  $\mu$  bulge luminosity with an intrinsic dispersion of  $0.35 \pm 0.06$  dex, fully consistent with previous observations at shorter wavelengths. To explore the connection between  $M_{\text{BH}}$ , bulge dynamical mass ( $M_{\text{d}}$ ) and stellar mass ( $M_{\text{s}}$ ) we first examine the fundamental plane (FP) and the Kormendy relation at 3.6  $\mu$  with two aims: (a) to identify possible non-classical bulges, (b) to supply receipts to compute the mass to light ratio (M/L) at 3.6  $\mu$  applying V- and K- color corrections. Despite the high accuracy of the  $M_{\text{s}}$  luminosity estimator, we find a tighter  $M_{\text{BH}}-M_{\text{d}}$  correlation (rms $\sim 0.3$  dex) with  $M_{\text{BH}} \sim M_{\text{d}}/1000$ .