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BLACK HOLE MASS ESTIMATES IN NEARBY AGN FROM HOST-BULGE PROPERTIES

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In this work we present the results of an optical photometric study performed to seven nearby AGN that were selected with the SDSS-DR5 database. Surface photometric techniques have been applied to the data in order to obtain B/D ratio and therefore the $M_{\rm R}$(Bulge) magnitudes. Bulge luminosities were then used to estimate the black-hole masse ($M_{\rm BH}$) in these AGN.

The observations of nearby AGN has always been relevant since they enable us to study their host galaxies properties in a more detailed way. In recent years, it has been shown that host-bulge properties are correlated with the mass of the compact objects associated with the nuclei of normal and active galaxies (for a review on this topic, see Ferrarese & Ford 2005). Therefore, in order to understand the formation and evolution of black-holes (BH) it is necessary to estimate the $M_{\rm BH}$ of active galaxies over the widest possible ranges of host-galaxy types. This is the main goal of our study, still in progress.

In this work, we present the first results obtained from a study of 7 nearby AGN. We have selected objects flagged as QSO in the SDSS-DR5 that have a Petrosian-g magnitudes between 14 < Mg < 17 and distances between $0.02 < z < 0.09$. An additional condition imposed to these AGN was that their host-galaxies should always have a major-axis size > 15″ in the isophote $\mu_{\rm B} = 25\,{\rm mag/arcsec^{-2}}$. These criteria allowed us to consider Type 1 (Sy1 and NLS1) as well as Type 2 (Sy2 and Sy1.9) AGN as good candidates for a deep imaging study using small-moderate size optical telescopes: NOT 2.5 m + ALFOSC, and SPM 1.5 m + Marconi. We present here the results obtained from our first couple of runs in (2006): (UT 1–2) with the NOT, and in November (UT 14–18) with the 1.5 m. We have observed Sy galaxies (i.e. with $M_{\rm B} < -23$) that have a distance range between 174.89 and 340.65 Mpc ($H_0 = 71\,{\rm km\,s^{-1}\,Mpc^{-1}}$, $\Omega_m = 0.3$ and $\Omega_\lambda = 0.7$). We have obtained several broad-band B, V, R images with minimum exposure times of 2400 s in B, 1600 s in V and 800 s in R. Our images are deep enough since we want to have a S/N∼3 in the isophote $\mu_{\rm B} = 25\,{\rm mag\,/arcsec^{-2}}$. Although the nights assigned with the NOT telescope were not photometric, we got images with a seeing fluctuating from ∼0.7–1.0″. The average seeing measured at SPM in the R band was ∼1.2″, but luckily the 4 assigned nights for this project were photometric dark nights. Thus, we have used the SPM data to calibrate the entire set of observed galaxies.

In order to perform the host-galaxy surface photometric study, we have followed the methodology given in Torrealba et al. (2006). Here we will present only part of our results. We have estimated the $M_{\rm BH}$ for each object using the correlation found by McLure & Dunlop (2002) but modified accordingly to our assumed cosmology. In Table 1 we show our estimates. These results, will be compared with $M_{\rm BH}$ estimations derived for the same AGN but with different methods.

TABLE 1

BLACK HOLE MASS

SDSS-Name	$M_{\rm R}$(Bulge)	$\log(M_{\rm BH})$
J020615.98 − 001729.1	−21.96±0.05	8.39±0.49
J021011.49 − 090335.5	−20.03±0.08	7.43±0.48
J030417.77 + 002827.3	−20.83±0.06	7.83±0.48
J073106.86 + 392644.7	−19.67±0.07	7.24±0.48
J211646.34 + 110237.4	−20.50±0.05	7.66±0.48
J212851.19 − 010412.4	−18.78±0.14	6.80±0.48
J234428.81 + 134946.0	−19.03±0.11	6.92±0.48

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