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INVESTIGATING THE PHYSICAL AND GEOMETRICAL PROPERTIES OF THE DUSTY TORUS IN QSO

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Usining mid-IR high angular resolution (0.3 arcsec) data from CanariCam on the 10.4m Gran Telescopio CANARIAS we study the mid-IR nuclear emission of a nearby ($z < 0.1$) sample of QSOs. The QSOs are selected with N-band flux ($f_N > 0.02$ Jy) and hard X-ray flux ($f_{X(2-10keV)} > 10^{43}$ erg s^{-1}). From the analysis of this data we find that the mid-IR emission is unresolved at scales of a few hundred of pc. We use unresolved emission at *H*-band (e.g., Veilleux et al. 2009b) and the IRS-Spitzer spectrum (e.g., Schweitzer et al. 2006) to build near- to mid-IR unresolved spectral energy distribution (SEDs).

These SEDs allow us to constrain the range of parameters of the CLUMPY models (Nenkova et al. 2008a,b) that best describe the nature of the dusty torus in QSOs (optical depth, radial thickness, viewing angle, number of clouds, angular width and profile of the radial distribution of clouds). Comparing these parameters with that obtained for a sample of Seyfert galaxies study by Ichikawa et al. (2015), we find that there is intrinsic differences between the dusty torus properties of QSOs and Seyferts, which can be explained in terms of a combination of the geometrical properties of the torus and the AGN luminosity. We also find than in average our QSOs prefer lower covering factor than Seyfert 2 galaxies. These results might be attributed to the presence of a receding torus in QSOs (Fig. 1), in which the high luminosity of QSOs have partly evaporated the clouds in the torus. To more details we recommend to read Martínez-Paredes et al. (2016) and reference therein.

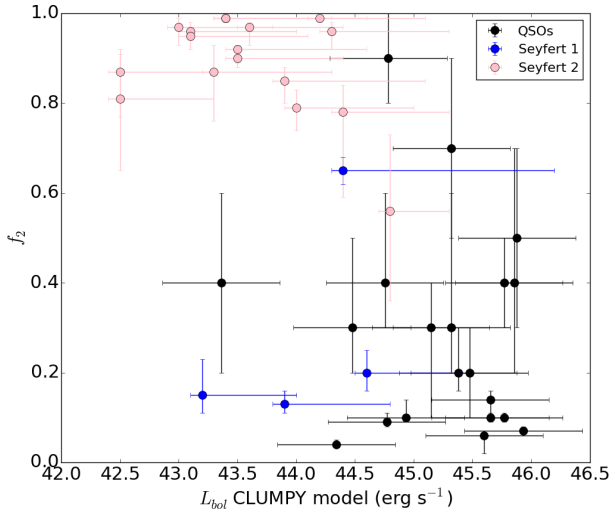

Fig. 1. Both geometrical covering factor (f_2) and bolometric luminosity predicted by the CLUMPY models that best reproduce the unresolved near-to mid-IR emission. The black points are the QSOs studied by Martínez-Paredes et al. (2016), while the type 1 and type 2 Seyfert galaxies studied by Ichikawa et al. (2015) are plotted in blue and pink respectively.

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