

Adaptive optics imaging of QSO UM402 field

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Abstract. We present initial results from adaptive optics deep imaging in the Ks-band of QSO UM402 ($z_{em} = 2.856$), with the IRCS camera on Subaru telescope.

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1) A faint companion galaxy ($m_k = 21.91 \pm 0.26$ in the Vega system) that lies $\sim 2''$ north of the QSO sightline has been clearly resolved by this high resolution imaging. The non-detection of this close companion by the previous deep R-band observation indicates that it has a red color $(R - K)_{Vega} > 3.3$ (Guillenmin & Bergeron 1997). This object has irregular morphology with two close components (separation $\sim 0''.3$). Given the small impact parameter ($b = 19.6$ kpc, at $z_{ls} = 2.531$), it might be a candidate galaxy giving rise to the Lyman Limit system absorption at $z_{abs} = 2.531$ seen in the QSO spectrum.

2) Careful subtraction of the PSF from the QSO image revealed the QSO host galaxy. We model in detail the host galaxy properties using the 2-D decomposition algorithm GALFIT, and find that QSO UM402 is hosted by a giant elliptical of $m_k = 20.19 \pm 0.15$ and of a scalelength ~ 4 Kpc, as bright as other resolved hosts of radio-loud QSOs (RLQ) at similar redshift, although UM402 itself is radio quiet (RQQ) (Falomo *et al.* 2008).

3) We estimated the black hole mass of this QSO using the CIV broad emission line from SDSS spectra, adopting the prescription given by Vestergaard & Peterson (2006). We found that UM402 is in good agreement with the $M_{BH} - \log L_V$ linear relation of the low- z bulges and ellipticals given by Dunlop *et al.* (2003), and other high- z QSO samples.

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