J03.13 A & B: A NEW MULTIPLY IMAGED QSO CANDIDATE

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Abstract. We report the discovery of a new gravitational lens (GL) candidate for the quasar J03.13 (z = 2.55). The mean angular separation and magnitude difference between the A & B QSO images are found to be 0.84″ and 2.10 mag, respectively. A spatially unresolved medium resolution spectrum of J03.13 shows intervening absorption line systems at $z = 2.34$ and $z = 1.085$. The latter one is possibly associated with a $\sigma = 206$ km/s lens galaxy.

1. Introduction

The multiply imaged QSO candidate J03.13 was discovered in 1993, during the last campaign of an ESO Key-Program aimed at searching for gravitational lenses among highly luminous quasars (Surdej et al. 1987, 1989). These observations were conducted at ESO (La Silla, Chile) with a direct CCD camera attached to the Cassegrain-focus of the ESO/MPI 2.2m telescope. High angular resolution multicolor imaging and low resolution spectroscopic observations were carried out with the New Technology Telescope (NTT) and SUSI or EMMI, respectively, at La Silla in Chile, in 1994. These observations tend to confirm the gravitational lens hypothesis.

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TABLE 1. Averaged photometry and relative astrometry.

Object	B$\pm\sigma_B$	R$\pm\sigma_R$	i$\pm\sigma_i$
J03.13 A	17.6±0.1	17.2±0.1	16.9±0.1
J03.13 B	19.7±0.1	19.3±0.1	18.9±0.1
J03.13 A-B	-2.16±0.05	-2.14±0.05	-1.99±0.05
$\Delta\theta_{AB} \pm \sigma$ (")	0.88±0.02	0.84±0.02	0.79±0.02

2. Results from the observations

Simultaneous fits of multiple point spread functions (PSFs) on the SUSI frames of J03.13 have been performed with a numerical profile fitting program, designed by Remy (1995). This allows us to derive the relative astrometric and photometric quantities of each individual component, reported in Table 1. Some residuals on the best R frame tend to show that J03.13 could possibly be better fitted with three point-like components.

A low resolution spectrum (3.5 Å per pixel) of J03.13 obtained with the NTT+EMMI shows that the QSO has a redshift $z = 2.55$ (instead of the value of 2.80 tabulated in Maza et al. 1993), and reveals two intervening absorption line systems: Lyα and CIV at $z = 2.34$ and MgII, MgI and FeII at $z = 1.085$. Unfortunately, because of the moderate angular resolution along the slit, this spectrum is spatially unresolved. More details about the reduction techniques and spectroscopic results may be found in Claeskens et al. 1995.

3. Conclusions

J03.13 is a new very promising GL having a small angular separation. The main arguments supporting this hypothesis are that i) both components A & B have approximately the same colors (contamination by a high z lens could account for the differences in the i filter reported in Table 1); ii) the absorption line system at z=1.085 could be due to the lens galaxy, whose velocity dispersion should be $\simeq$ 206 km/s to account for the observed angular separation between the two images.

HST observations of J03.13 should clear up the nature of the two (three?) images of the QSO, and eventually the presence of the lens.

References

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