

# The extended gas halo of QSO host galaxies

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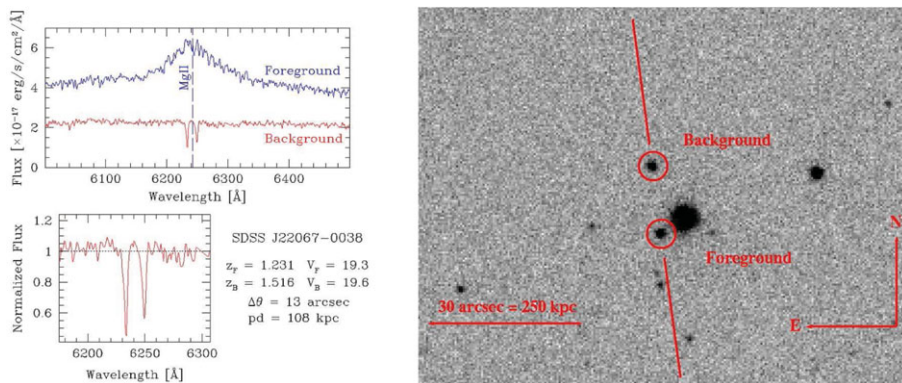
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**Abstract.** We investigate the MgII 2800 and CIV 1540 absorption features of the gas in the halo of a foreground QSO through the absorption imprinting on the spectra of a background QSO that is closely aligned with the nearest quasar. We present the results for 13 QSO pairs ( $0.7 < z < 2.2$ ) that allow us to probe the gas at distances between 60 kpc and 120 kpc from the QSO nucleus. We identify absorption features associated with the foreground QSO in 7 out of 10 systems for MgII, and one out of 3 for CIV (see example in Fig. 1). At variance with the case of inactive and less massive galaxies we find that relatively strong ( $EW \sim 1 \text{ \AA}$ ) absorption features are present out to a radius of 100 kpc. This suggests that a large extended halo is associated with massive galaxies.

The comparison of these results with those for inactive (not hosting active black holes) galaxies (see e.g. Chen *et al.* 2010a) shows that the halo of QSOs is similar to that of inactive galaxies. In the observed sample we do not detect a significant enhancement of the absorption strengths, as it could be expected if the QSO nuclear activity were driven by intense gas accretion onto the black hole. Moreover along the line of sight of the QSO we do not detect any Mg II absorbers of the same strength of the transverse one. These results are in agreement with models that consider a non-isotropic emission of the QSO, which are hosted by massive gaseous halos.

**Keywords.** galaxies: quasars: absorption lines



**Figure 1.** Example of QSO projected pair showing intervening MgII absorption.

## References

Chen, H.-W., Helsby, J. E., Gauthier, J. R., Shectman, S. A., Thompson, I. B., & Tinker, J. L. 2010, *ApJ*, 714, 1521