activity. A very particular case in our sample is the ultraluminous IC 1623A/B, where the molecular gas is not concentrated to the nucleus but rather associated with dust lanes between the two merging galaxies, showing very wide profiles (~ 450 km s^{-1}).

FAR INFRARED AND OPTICAL PROPERTIES OF A SAMPLE OF SEYFERT GALAXIES[1]

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The optical spectra of a sample of 38 *IRAS* galaxies have been analyzed in order to determine the chemical enrichment of the ionized gas and its possible relation with star formation events which have occurred in the nuclear region of these galaxies. The optical and IR observations allow us to separate them in type 1 and 2 Seyferts and analyze the relationship between the luminosity of optical emission lines and the far-IR luminosity (L_{IR}). The stellar population is analyzed using stellar population templates and mostly W(CaII K) as dilution diagnostic by young components. The internal reddening affecting the stellar population is derived. By comparing the far-IR colour indices with the corresponding values obtained from models of dust grains emission, the temperature of the dust and its spatial distribution have been inferred.

[1] Based partly on observations made at CTIO and CASLEO.

QSO ABSORPTION LINE SYSTEMS

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Most of the QSO absorption line systems showing metallic lines are generally associated with galactic haloes of intervening galaxies (Sargent 1988). However, deep imaging observations and similarities of these systems with those observed in nearby galaxies seem to indicate that the absorption lines could be produced in star forming regions of the interving objects (Yanny et al. 1990, ApJ, 351, 412; York et al. 1990, ApJ, 351, 412).

The detailed analysis of high redshift absorption systems shows that the observed equivalent widths of the metallic lines can be explained by absorption in an H II region ionized by an O4 star, and with density $n_H \leq 10$ cm^{-3} and undersolar abundances (Viegas & Gruenwald 1991, ApJ, 377, 39).

About 20 low redshift systems (or Mg II systems) have also been analysed, leading to the same conclusions (Gruenwald & Viegas 1992, ApJ, submitted). The halo model has also been tested, assuming that the gas is photoionized by the *UV* integrated radiation from the QSOs (Madau 1992, ApJ Letters, in press). Considering the same observed systems, the halo model can only reproduce the observed lines if the chemical abundances are close to solar.

THE LYα FOREST AT $4.2 < z < 4.5$

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A preliminary analysis has been made of the spectrum of the $z = 4.5$, $m \approx 18.3$ QSO 1033–03 observed with the CTIO 4-m telescope + echelle spectrograph in February 1992. The resolution is 12 km s^{-1} FWHM and the signal-to-noise ratio is 10–15 in the Lyα forest continuum. The data have been profile-fitted as in Rauch et al. 1992 (ApJ, 390, 387). There are 66 Lyα absorption lines in a complete sample spanning $4.2 < z < 4.5$ with a H I column density completeness limit of 13.6 in log and mean error of 0.13 in log. The H I column density number distribution can be described by a power law $d\mathcal{N}/dN_{HI} \propto N_{HI}^{-\beta}, \beta = 1.60 \pm 0.07$ (using a maximum-likehood estimator) with a Kolmogorov-Smirnov probability of a power law fit of 0.34. This value for β is in the lower range of values found at $1.8 \lesssim z \lesssim 3.8$ ($\beta \sim 1.7 \pm 0.1$ e.g., Rauch et al.). We do not find the correlation between H I column density and Doppler parameter suggested by Pettini et al. 1990 (MNRAS, 246, 545). The median Doppler parameter is $b = 26$ km s^{-1} with a mean error in b of 7 km s^{-1}. The median is more useful for comparison to lower z results than the mean because the median is less sensitive to contamination by possible unidentified metal lines at low b and unresolved blends at high b. The possible contamination of the sample by metal lines is judged at $\lesssim 5\%$ as defined by systems with $b < 10$ km s^{-1}. The median in this sample is lower than the median of 30–35 km s^{-1} found at $1.8 \lesssim z \lesssim 3.8$ (e.g., Rauch et al.), implying that the clouds are cooler and/or less dynamically active at early epochs.

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