It was necessary to reexamine the Lauberts sample, restricted by the dwarf galaxy criteria, since the coarse Lauberts classification based on ESO(B) plates does not record adequately the dwarf galaxy population. But the Lauberts catalogue is still well suited for the purpose of object identification. It is homogeneous and almost complete with respect to objects larger than 1.′0.

We started with a total of 7,002 systems. A final threefold examination led to a catalogue containig 584 systems, from which 20 did not appear in the ESO/Uppsala Catalogue. The catalogue is published in *Astronomy & Astrophysics Supplement Series,* **61,** 503, 1985.

Figure 1 presents the distribution of the 584 dwarf galaxies in Aitoff projection. The belt of the Milky Way is clearly seen, the SMC and LMC are also marked and four pronounced empty regions.

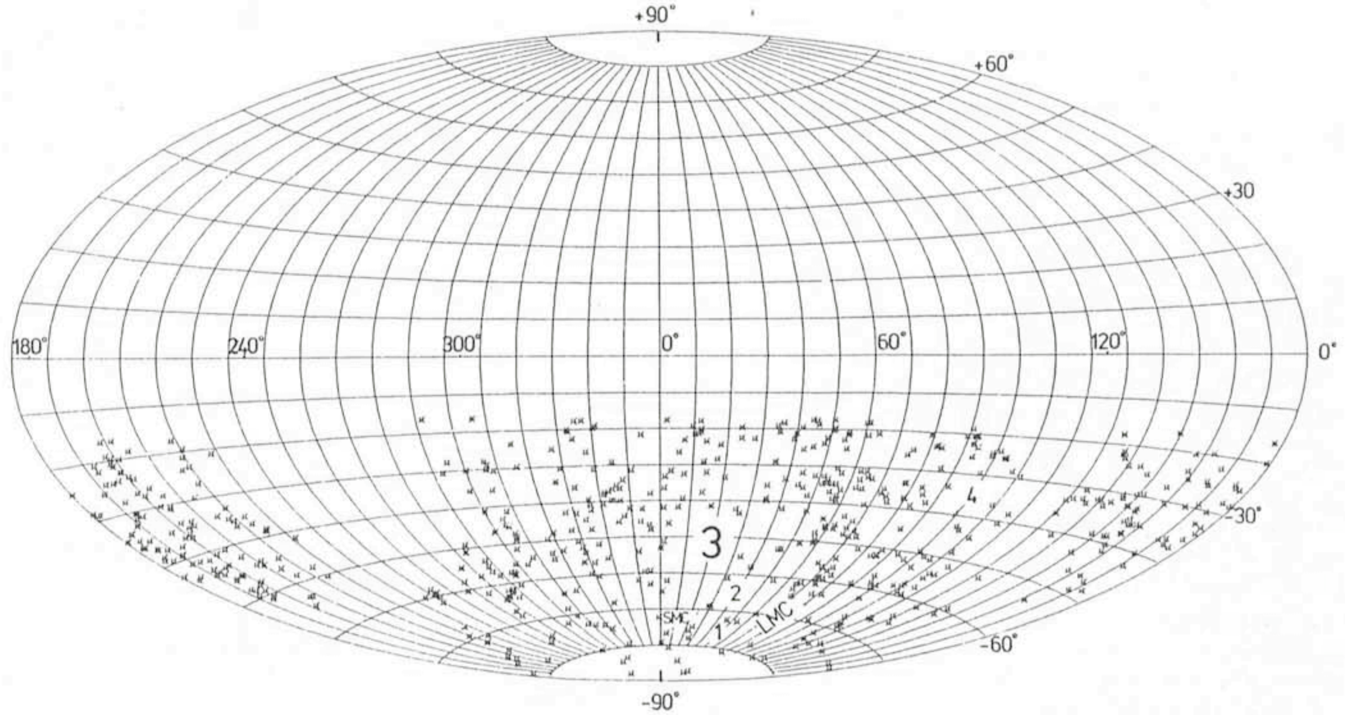

Figure 1: *Distribution of the dwarf galaxies on the sphere in an Aitoff projection. The Milky Way and the Magellanic Clouds as well as four other pronounced empty regions are indicated. The regions (1, 2, 3) coincide with the Magellanic stream, region 4 coincides with a dark cloud complex (No. 445, 446, 447, 450, 453 in the catalogue of Feitzinger and Stüwe, 1984).*

THE EXTRINSIC ABSORPTION SYSTEM IN THE QSO PKS 2128-12:

A Galaxy Halo with a Radius of 65 kpc

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1. The Different Types of Extrinsic Absorption Systems

A large number of absorption lines are detected in the spectra of QSOs. Most of them are identified with lines from ions of abundant elements at a redshift z_α smaller than the QSO emission redshift z_Q and their velocity dispersion is small, typically $5 \leq \sigma_v \leq 50$ km s^{-1}. These absorption systems at $z_\alpha < z_Q$ are now commonly believed to be of intervening origin, but their exact nature remains still an open question. Indeed, these systems are only known by their absorptions. Most of them are too faint to be accessible to direct observations with present-day techniques, except, may be, those at small redshift.

Before describing our attempt to detect directly one of the low z absorption systems, let us quickly present the two main classes of extrinsic absorbers, that is those at $z_\alpha < z_Q$. First there are metal-rich systems in which hydrogen and the most abundant heavy elements are present. These absorbers could be associated with galaxies, but then all spiral galaxies must have gaseous halos about four times larger than the luminous parts of the galaxies. This population has been detected within a large redshift range from about 0.2 to 3.7. The high redshift absorption systems, detected mainly by their C IV absorption, have some properties which differ from those of the lower redshift ($z \leq 1$) absorbers, detected up to now by their Mg II or Fe II absorptions (a survey of their C IV absorption would require a large space-based UV telescope). They are much more numerous than the low z systems, even after removing the effect due to the expansion of the universe, and they have a higher degree of ionization. In the assumption of absorption by intervening galaxies, this may suggest that either the degree of ionization of gaseous halos increases outwards, or that these halos were larger and more ionized in the past.

The second population of absorption systems has primordial or very metal-poor gas, with only lines of the H Lyman series present. These absorbers, called the Lyα forest, are known only at $z \geq 1.7$ and their study at smaller z will be done when a large space-based UV telescope will be available. At $z = 2.5$, the number density of these systems is one hundred times larger than for the metal-rich population. This raises the crucial problem, not yet solved, of the nature of the Lyα forest systems: do they constitute a primordial population independent of the galaxies? How do they evolve? Has any of these systems survived to the present epoch?

2. Detection of a Galaxy Identified with the Absorption System in PKS 2128-12

Since no extrinsic system at $0.1 < z_\alpha < z_Q$ has yet been identified, we have concentrated our efforts on the most promising cases: the metal-rich absorbers at low redshift. If these systems are associated with extended disks or halos around spiral galaxies, it should be possible to detect these galaxies by broad band imaging. Indeed a typical spiral galaxy at $z \leq 0.5$ should have a magnitude m (V) ≤ 22.5 (Weymann et al. 1978, Guiderdoni and Rocca-Volmerange, 1985) within the range of detectability with present-day techniques. The Holmberg diameter (magnitude limit of 25 per $arcsec^2$) of a typical spiral galaxy is 44 kpc (average over the luminosity function and using $H_o = 50$ km s^{-1} Mpc^{-1}) or about 6 arcsec at $z = 0.5$ (independent of H_o). This implies that in good seeing conditions, faint distant galaxies at $z \leq 0.5$ are resolved and therefore can be distinguished from faint foreground Galactic stars. Finally, although the galaxies possibly associated to the absorbers are faint and close on the sky to a bright point source, the QSO, they are not so close as to be undetectable. The average size of the absorbers derived from Mg II statistical studies (Young et al. 1982) corresponds to an angular radius of 6 arcsec at $z = 0.5$, distance from the QSO large enough to detect a 22-magnitude object close on the sky to a 16 magnitude point source even with moderately good seeing.

We started a CCD broad-band imaging survey of QSOs with low redshift absorption systems and found in 8 cases faint extended objects, less than 15 arcsec away from the QSO line of sight.

A narrow absorption Mg II doublet at $z = 0.4299$ is present in the spectrum of the QSO PKS 2128-12. The QSO emission redshift is 0.501 and the absorber should belong to the class of extrinsic systems. The field around PKS 21218-12 was first observed during our CCD broad-band imaging survey in September 1982, at the 1.5 m Danish Telescope on La Silla. We discovered a faint object 8.6 arcsec northeast from the QSO, which was resolved in the images of best seeing (resolution: FWHM = 1.3 arcsec) and has a magnitude in the Gunn r band of 21.0.

A spectroscopy follow-up of this faint object, potential candidate for the absorber, became possible with the availability of the ESO faint object spectrograph and camera (EFOSC). In September 1985, we observed at the 3.6 m telescope on La Silla the field around PKS 2128-12 in the imaging mode of EFOSC through a V filter. The exposure time was 3 minutes and the image was corrected from the CCD offset and flatfielded. The 2.9 arcmin square central parts are shown in Fig. 1, and 10 resolved objects are present. The object 8.6 arcsec northeast of the QSO (labelled ≠ 1 in Fig. 1) has a magnitude $m_v = 21.5$. The next closest (≠ 3) is much further away at a distance of 38 arcsec from the QSO line of sight. The spatial distribution of the resolved objects is fairly homogeneous, with no special clustering around the line of sight to the QSO.

In the spectroscopy mode of EFOSC we took two spectra of object ≠ 1, each of one hour exposure. A blue grism providing a dispersion of 230 Å per mm was used and the slit width was of 1.5 arcsec. This combination gives a spectral resolution of

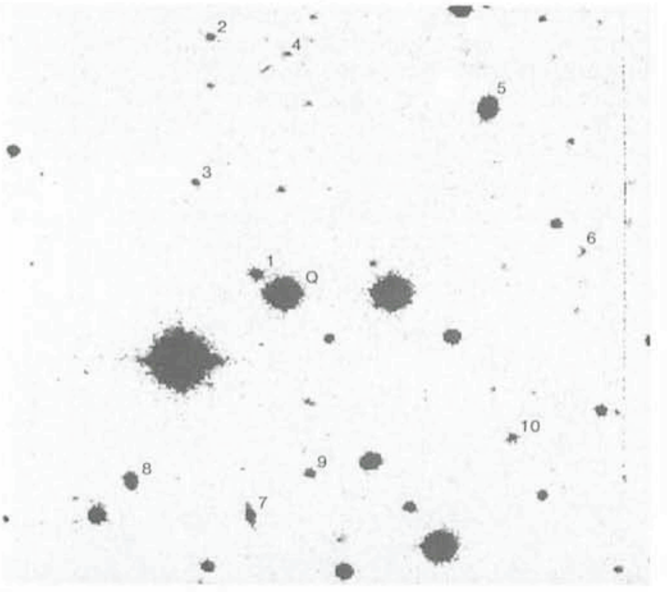

Fig. 1: *CCD imaging with EFOSC at the 3.6 m of the field around the QSO PKS 2128-12. This is a 2.9 arcmin square field centered on the QSO. Northeast is at the top left corner. The seeing is of FWHM = 1.6 arcsec.*

FWHM = 14 Å in the wavelength range λλ3700–7000. At the blue edge of this region, $\lambda \leq 3950$ Å, the sensitivity of the RCA CCD used was too low to detect any signal from a faint target as object ≠ 1. After each exposure on the object we recorded a flat field image and Helium and Argon spectra. The slit was oriented in the east-west direction and the spectrum of object ≠ 1 was integrated over 5 pixels or 3.4 arcsec along the slit. The resulting spectrum is shown in Fig. 2 after sky subtraction and wavelength calibration. The signal to noise ratio reaches 10 to 12 in the central parts of the spectrum.

Two emission lines (one just at the red end of the spectrum) are clearly visible as well as two close-by absorption lines. The continuum and the emission line at λ 5331.7 are resolved along the slit when compared to the spectrum of a standard star. The redshift derived from all the detected lines is $z = 0.430 \pm 0.001$, value equal to the redshift of the absorption system. The lines present are identified with [OII] λ3727 and Hβ in emission and Ca II H and K in absorption.

3. Nature of the Mg II Absorption System Detected in PKS2128-12

The $z = 0.4299$ absorption system in PKS 2128-12 appears to be associated with a gas-rich galaxy with center 8.6 arcsec or 64 kpc away from the QSO line of sight. Within the uncertainty of our measurements, $\Delta v = 210$ km s^{-1}, the galaxy and the absorber have the same redshift. The galaxy is elongated in the east-northeast, west-southwest direction and the line of sight of the QSO intercepts the plane of the galaxy at a radius of 80 to 110 kpc, or 4 to 5 Holmberg radii. The projected radius of the visible part of the galaxy (V or Gunn r images) is only of about 15 kpc in the direction towards the QSO line of sight.

Are there other properties of the absorption system which may help to specify the nature of the absorber: disk or halo? The H I column density of the absorber can be derived from UV observations of PKS2128-12 with IUE (Bergeron and Kunth, 1983). From the existence of a Lyman discontinuity at $z = z_\alpha$, and using a damping limit for Lyα absorption we find $4\ 10^{17} < N\,(HI) \leq 8\ 10^{18}$ cm^{-2}. The absorber is optically thick to UV ionizing photons but is not a cloud of neutral gas since Mg is not mainly in the atomic form N (Mg I)/N (Mg II) = 10^{-3} (Tytler et

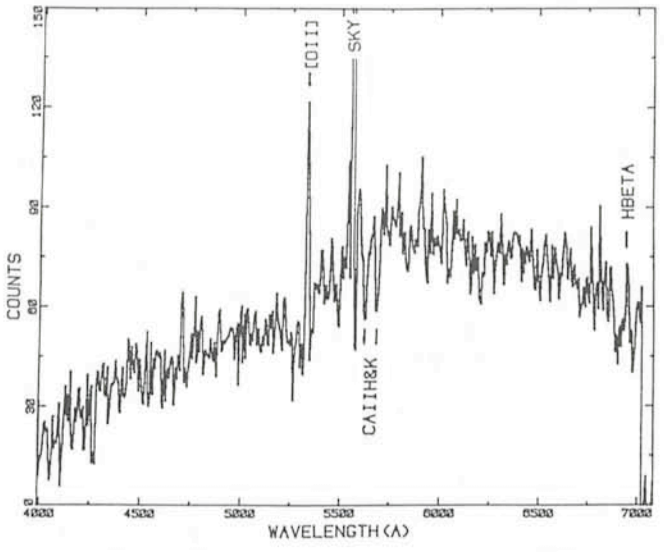

Fig. 2: *Spectrum of galaxy ≠ 1 (m_v = 21.5) 8.6 arcsec northeast of the QSO obtained with EFOSC. It is the sum of two spectra, each of one hour exposure. The spectral resolution is FWHM = 14 Å. The redshift derived from the emission and absorption lines is 0.430; it is equal to the redshift derived from the MgII doublet detected in absorption in the spectrum of the QSO.*

al., 1985). The velocity dispersion of the MgI and MgII lines is small, b ~ 8 km s^{-1}, and the HII column density derived in the assumption of normal abundances is 7 10^{19} cm^{-2} if Mg is mainly singly ionized. The CIV doublet is not detected in the UV spectrum with w (CIV1549)/w (MgII 2800) ≤ 1.3, and the degree of ionization of the absorber appears similar to, or possibly lower than, those observed in high latitude gas in our Galaxy.

From the above properties we conclude that the absorbing cloud on the line of sight to PKS 2128-12 is more likely associated to a very extended disk than to a halo around a spiral galaxy of absolute luminosity M_V = −20.8.

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Comet Halley's Plasma Tail Photographed from Germany with a Focal Reducer to be Used at ESO's 1 m Telescope

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A picture of the plasma tail of Comet Halley was obtained at the 1 m telescope of Hoher List Observatory on November 12, 21 UT. A focal reducer, combining instrumentation built at Hoher List Observatory and the Max-Planck-Institute for Aeronomy, was used. At a 1 m telescope the plate scale of the focal reducer very nearly equals the scale of the ESO Schmidt telescope but the field has only 25 mm diameter, corresponding to about 0°.5 in the sky. The exposure of Comet Halley was taken through an interference filter of a bandpass of 425+/−3nm, which transmits the 0–2 band of the CO^+ comet tail band system. A two-stage proximity focus image intensifier was employed and 103a-F film was pressed against its exit window. Exposure time was 15 minutes.

The picture is shown in figure 1. At the time of exposure Comet Halley was at a geocentric distance of 117 million kilometers and quite close to opposition, i.e. the angle earth-comet-sun was only 9°. This is an unusual geometry for comet observations. As the cometary plasma is interacting with the solar wind, which flows nearly radially out of the sun, the comet tail is always pointing away from the sun. Therefore, in the picture we look very much along the cometary tail. While the projected length of the comet tail as seen on the photograph amounts to about 5 × 10^5 km, its true length may exceed 3 million kilometers. The fact that in the picture the tail forms a large angle with the antisolar direction may be caused by a slight deviation of the solar wind direction from radial towards south.

With the same instrumentation a program will be conducted at the ESO 1 m telescope when Comet Halley will be best visible from the southern hemisphere. The program aims at the determination of content and topology of cometary ions CO^+, N_2^+, CO_2^+ and H_2O^+ in relation to the neutral coma molecules. Considering the excellent sky conditions at La Silla as compared to German November days we hope to obtain very good observations in March and April 1986.