cal conditions prevailed all the time except one night when some cirri were present. Altogether about 170 polarimetric observations for different parts in Halley's coma could be obtained.

The reduction revealed that nearly all measured areas around the core (except position 2) exhibited a circular polarization between 0.5% and 0.9%. Though these values are very near to the detection limit of our device, it is important to note that the sign of the polarization did not change, it was always left-handed. Area 7 did not reveal any polarization. However, area 2 was variable in its polarization from night to night with polarization degrees up to about 2% decreasing for the distance of 15″ and 60″ as well. These variations were evidently correlated with the strengthening and faintening of red dust jets emanating from the sun-heated side of the core. The jets showed a length of about 20″ during our observing runs as seen through the Bochum 61-cm telescope (Celnik, W., 1986, private communication). The changing activity did, however, never affect the sign of the polarization at all. This indicates that the measured polarization is not an artifact photometrically produced by these events. Furthermore, subsequent measurements using 21″ and 10″ apertures revealed that the observed polarization was diminished by a factor of 8 for the larger aperture whereas the result for the smaller one remained the same. This also seems to prove that the circular polarization is (at least in area 2) a small-scale effect. The core was measured also using different apertures. A maximum circular polarization of about 0.9% was determined for an aperture of 15″ decreasing appreciably with increasing or decreasing apertures.

How can our measurements be interpreted in terms of the present theories concerning the mechanisms for producing circular polarization in comets? Basically an admixture of non-metallic particles within the coma is needed for scattering processes of the sun light. If these particles are non-spherical, they must be aligned either by magnetic fields or by radiative pressure at least for single scattering. This type of scattering, however, should be excluded by the fact that the sign of the polarization in different areas remained always the same. It is highly improbable that the alignment of the particles is everywhere the same in view of such an active nucleus. Multiple scattering in the dust rich area near the nucleus seems to give a more promising explanation. This process would not necessarily need non-spherical aligned particles for a phase angle (Sun-Comet-Earth) not too far away from 90°. Both, degree and sign of the circular polarization, depend then on the actual phase angle which was around 66° during our observing runs. The results of multicolour observations obtained at roughly the same phase angle are needed to support this interpretation.

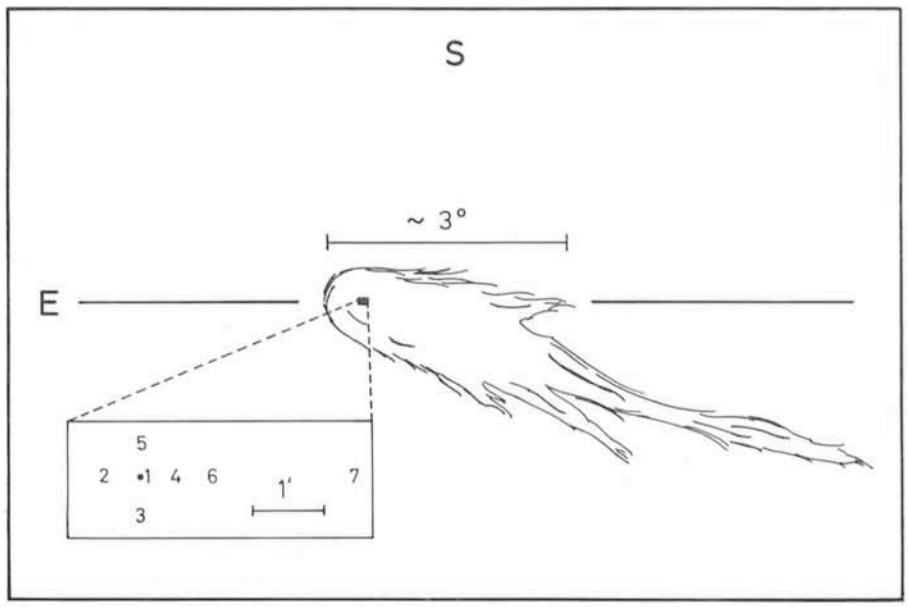

Figure 1: *Sketch of Comet Halley as it appeared during the observing runs. The enlarged portion shows the different positions of the measurements. The core is indicated by 1. Positions 2, 3, 4 and 5 refer to a distance of 30″ from the core and are those areas where most of the measurements were obtained. Additional observations were also performed for distances of 15″ and 60″ in those directions. Position 6 corresponds to a distance of 60″ and position 7 to a distance of 180″. (10″ correspond to a length of roughly 9,000 km on Halley.)*

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Images of Comet Halley – A Slide Set

ESO announces the publication of a limited edition of this slide set. It is composed of some of the best images of Comet Halley, obtained at La Silla during the period December 10, 1982, to April 30, 1986. The slide set only includes direct images, although other types of observations – for instance photometry and spectroscopy – were also carried out at ESO, cf. the articles in this *Messenger* issue. The 20 slides are in colour and B/W and emphasize the different observing techniques. They start with the first CCD images, which were obtained with the Danish 1.5-m telescope, when Halley was still more than 10 A.U. from the sun. The set also includes the recovery image on February 15, 1986, which was made only six days after perihelion. A spectacular disconnection event on March 10, 1986, is documented with three Schmidt pictures and the impressive changes in the tail can be followed on Wide-Field CCD images. Some slides are very beautiful, like a colour picture of Halley in the southern Milky Way.

The slide set is accompanied by a comprehensive text, giving details about the instruments used and the circumstances of each image. This set is therefore particularly useful for educational purposes. Copies may be obtained by sending DM 35,–, which is the equivalent of the cost price including postage, to:

ESO Information and Photographic Service
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