POLARIZATION MEASUREMENTS AND EXTINCTION NEAR THE NGP

T. Markkanen
University of Helsinki, Observatory and
Astrophysics Laboratory

In order to study interstellar extinction near the NGP a polarization observation programme has been undertaken at the Metsähovi Observatory of the University of Helsinki. 32 stars ($b > 80^{\circ}$) have been measured with an accuracy of a few hundredths of a percent. To this list observations of 42 stars made by Appenzeller (1968) were added. The stars measured have distances up to 400 pc (Figure 1).

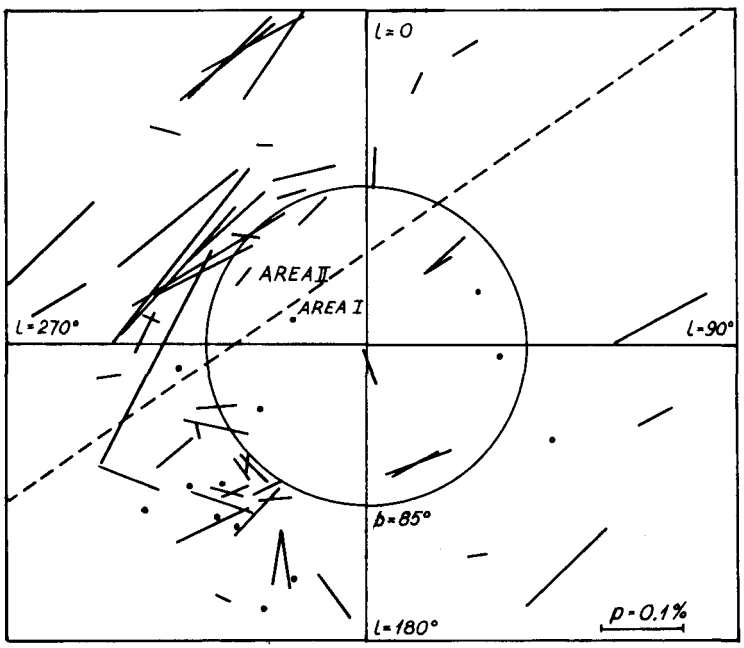

Fig. 1. Polarization vectors near the NGP. Dots are stars with zero polarization.

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There seems to be an area of higher polarization values at $l \approx 270^{\circ}-360^{\circ}$. In this area (II) the polarizations are low at small distances but between about 100 and 200 pc they increase to about 0.3 % and remain constant up to 400 pc. Elsewhere (I) the polarizations increase slowly with distance and reach a value of about 0.1 % at 200 pc (Figure 2).

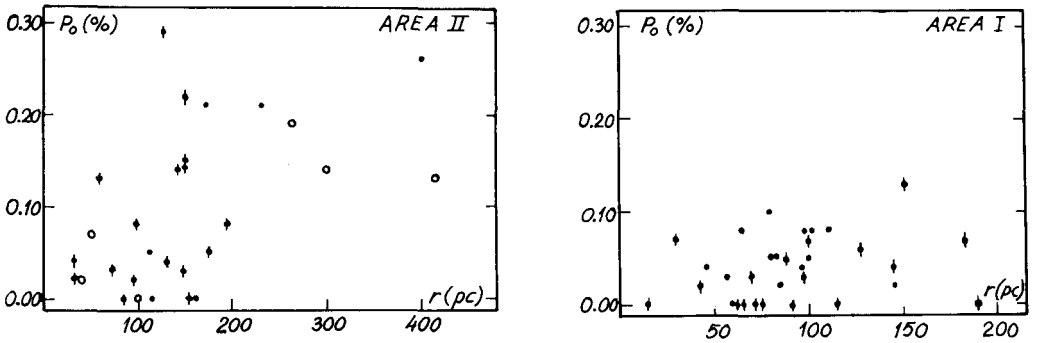

Fig.2. Amounts of polarization versus distance in areas II and I. Polarizations of the ticked dots are from Appenzeller (1968).

It can be concluded that there is a dust cloud at $l \approx 270^{\circ}-360^{\circ}$, at a distance of about 100-200 pc.

There is a correlation between the polarizations and the colour excesses E(b-y) measured by Feltz (1972). The excesses seem to be systematically too low by $0^{m}.01$. Similar results were obtained photometrically by Hilditch et al. (1976). By using the polarizations the lower limits of extinction can be estimated ($A_V \geq 0.3p$). $A_V \geq 0^{m}.03$ is found generally at the NGP, $A_V \geq 0^{m}.1$ in the direction of the cloud in the fourth quadrant.

REFERENCES

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Feltz, Jr., K.A.: 1972, Publ. Astron. Soc. Pacific 84, 497.
Hilditch, R.W., Hill, G. and Barnes, J.V.: 1976, Monthly Notices Roy. Astron. Soc. 176, 175.