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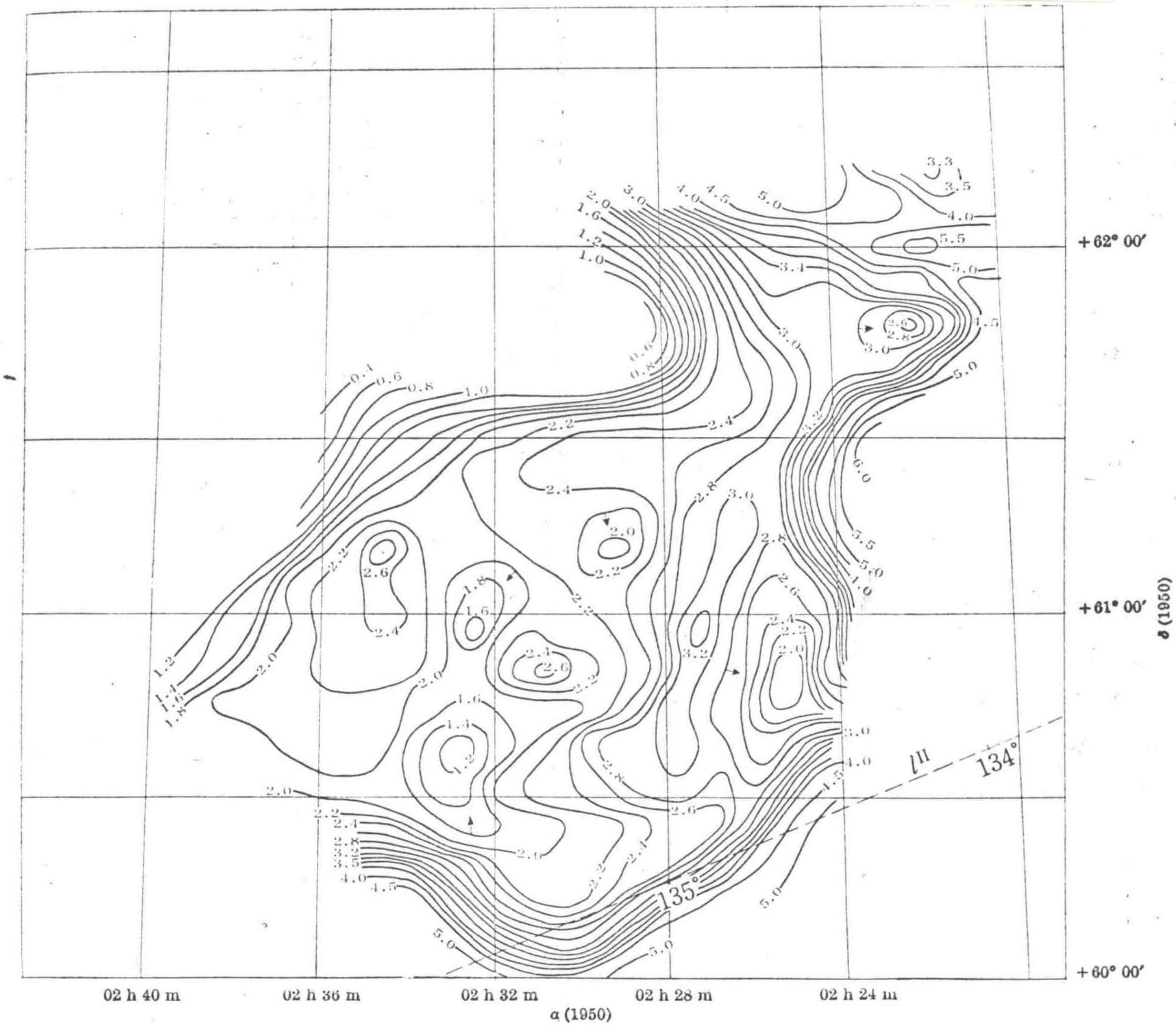

Fig. 4. Interstellar absorption map in magnitude units of *IC*1795 = *W*3 and *IC*1805 = *W*4 at λ6563 Å.

Figs. 1–4 show a comparison for a complex region near the galactic equator (l^{II} is about 134 degrees). Fig. 1 is a photograph in Hα light, Figs. 2 and 3 are the contour maps in Hα and in microwave radio emission at 4,170 MHz (ref. 2), and Fig. 4 shows the surface distribution of interstellar absorption over the region. The two emission nebulae in the field are *IC*1795 and *IC*1805 (*W*3 and *W*4, respectively, as radio sources).

Small scale structure of absorption is clearly seen in Fig. 4 as well as the general tendency towards heavier absorption in lower galactic latitude[3]. The absorption obtained is chiefly that within the H II region, but also includes a contribution from the space between the Earth and the H II region. In any case, this is an independent method of obtaining a map of interstellar absorption. Interstellar absorption is currently obtained by stellar photometry. The observational data, however, are not an absorption value but a colour excess, and the ratio of space absorption to colour excess is still not well known. The technique presented here is one of the methods for deriving an absolute value of absorption and it will help to clarify the role of the interstellar dust grains in the H II regions.

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Production of OH Molecules in Interstellar Shock Waves

Measurements made recently at Berkeley have shown that there is interstellar OH absorption in most low latitude radio sources[1]. Most indications are that the excitation, unlike that in the intensely emitting regions[2], is fairly normal, and that the state temperature is $T < 10°$ K. If it is assumed that $T = 3°$ K (a minimum value, from the cosmic microwave background), the median value of OH/H is about 4×10^{-8} in sources in which both OH and H lines can be measured. This ratio, which corresponds to OH/O $\sim 6 \times 10^{-5}$, is not far from that of CH and CH^+, seen optically. An attempt by Bates and Spitzer to explain the abundance of CH by two body radiative association[3] failed by more than three orders of magnitude. This led Stecher and Williams[4] to propose that chemical exchange reactions on grains of the form $GX + Y \rightarrow G + XY$ (where $X = H$, $Y = O$ for OH) could operate in the heated regions behind interstellar shock fronts. They calculated