It is of interest to compare this source with the continuum emission from W3(OH), the compact component associated with OH emission in the H II region W3. This component has also recently been observed with the 5-km telescope (Fig. 2). The position of the centre is:

$$\left.\begin{array}{r}02\text{ h }23\text{ min }16.44\text{ s}\pm0.01\text{ s}\\ 61^\circ\ 38'\ 57''.18\pm0''.10\end{array}\right\}1950.0$$

The total flux density at 5 GHz is 0.62 ± 0.02 f.u. and nearly all of the emission originates in a compact elliptical component whose diameters are (1.9 ± 0.2 arc s) and (2.3 ± 0.2 arc s) with the major axis in position angle of about 60°.

Earlier observations of W3(OH) by Wynn-Williams[7] with the 1-mile telescope showed that the source had dimensions of <4.5 arc s $\times <5.2$ arc s. He derived a model which fitted these observations and accounted for the spectrum. Assuming a distance of 3 kpc and an electron temperature of 10^4 K he concluded that the source was of diameter 0.024 pc and contained a total mass of ionized hydrogen of 0.042 $M_\odot$.

In the light of the new data these figures must be slightly revised; the compact component has dimensions of 0.027×0.033 pc. Because the compact component is optically thick at 5 GHz (ref. 7) the observations may be used to derive an electron temperature of $10{,}000\pm1{,}000$ K. Using the spectrum of Wynn-Williams *et al.*[8] we obtain a central emission measure of $\sim4.7\times10^8$ pc cm^{-6}, and a mass of ionized gas of 0.068 $M_\odot$. Using the 86 GHz point shown on the spectrum in ref. 8 we obtain $L_c\sim2.5\times10^{48}$ s^{-1}, indicating that there is probably a central exciting star of type 07 or earlier.

Cooper, Davies and Booth[9] have measured the relative positions of 16 components of the 1,665 MHz emission from W3(OH). Although the positions are not absolute the mean position determined by Raimond and Eliasson[10] for the 1,665 MHz emission lies within a few arc s of the centre of the continuum source. We suggest that the OH components determined by Cooper *et al.* may be located around the periphery of the continuum source as shown in Fig. 3. This distribution strongly supports the model of stimulated OH emission proposed by Cook[11,12] who concluded that the emission will occur only where there is a long path-length in the line of sight in a medium of low temperature and small velocity dispersion; at the same time the region must lie close to the boundary of the H II region. The observed absence of OH sources within the disk of the H II region, and their confinement within a narrow strip round the edge agrees well with this model.

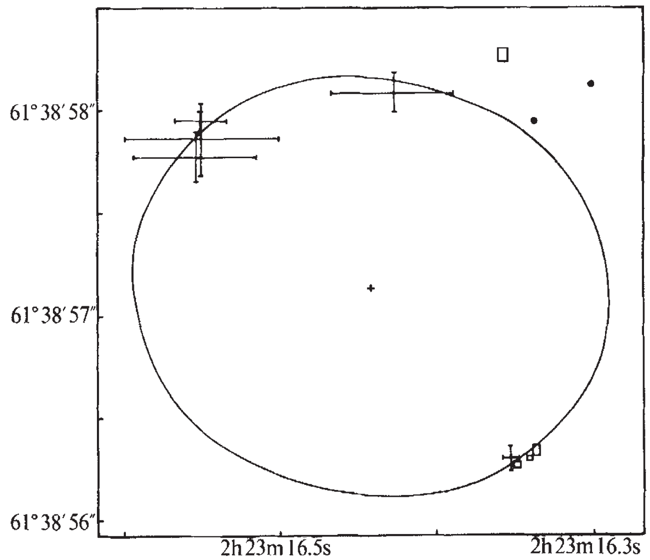

Fig. 3 Map showing the elliptic model of the W3(OH) continuum source fitted to the relative positions of the OH components[9]. The errors in the relative positions of the OH sources are indicated by error bars; the errors in the radii of the ellipse are ±0.1 arc s in any position angle.

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Solar Electrical Discharges

Hemenway *et al.*[1] state, "We conclude that most of these submicron particles have come from the Sun, although this hypothesis poses formidable problems". These problems do not arise if the white streaks which can clearly be seen in the perimeter of sunspots are electrical discharges, because the temperature at points between or remote from these discharges at their level is low enough for particles to form and radiation pressure would cause some of them to be ejected. The presence of atmospheric particles generally leads to the formation of electrical charges[2].

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Response of a General Circulation Model of the Atmosphere to Removal of the Arctic Ice-cap

Over the past few years, numerical models have been developed for investigating the general circulation of the atmosphere and studying its long term behaviour. (See, for example, Smargorinsky *et al.*[1], Kasahara and Washington[2].) These models are firmly based on the equations of fluid motion and thermodynamics and simulate in mathematical terms the chief physical processes which are thought to be of importance in determining large scale atmospheric motions over long periods of time (a month or more). The advent of very high speed computers has made numerical experiments with these models reasonably easy.