

The Supernova of A.D. 1006

F. F. GARDNER AND D. K. MILNE

Commonwealth Scientific and Industrial Research Organization, Chippendale, N. S. W. Australia

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Radio observations have been made near the suggested location of the supernova of A.D. 1006. A polarized extended radio source (1459-41) is considered to be the probable remnant of this supernova.

RECENTLY, Goldstein (1965) has reviewed the historical evidence for a very bright stationary object, possibly a supernova, which appeared in the southern sky in A.D. 1006. Marsden (1965) has narrowed the field down to $14^{\text{h}}50^{\text{m}} < \alpha_{1950} < 15^{\text{h}}40^{\text{m}}$, $-50^{\circ} < \delta_{1950} < -40^{\circ}$, and with less certainty to $15^{\text{h}}00^{\text{m}} < \alpha_{1950} < 15^{\text{h}}24^{\text{m}}$, $-47^{\circ} < \delta_{1950} < -44^{\circ}$. Radio evidence presented here suggests that the remnant of this supernova is located at

$$\left. \begin{array}{l} \text{Right ascension } 14^{\text{h}}59^{\text{m}}.6 \\ \text{Declination } -41^{\circ}42' \end{array} \right\} \text{ (epoch 1950.0).}$$

The south preceding part of this radio source was listed in the catalogue of Bolton, Gardner, and Mackey (1964)—source number 1459-41. Because of its extension in declination and possible association with

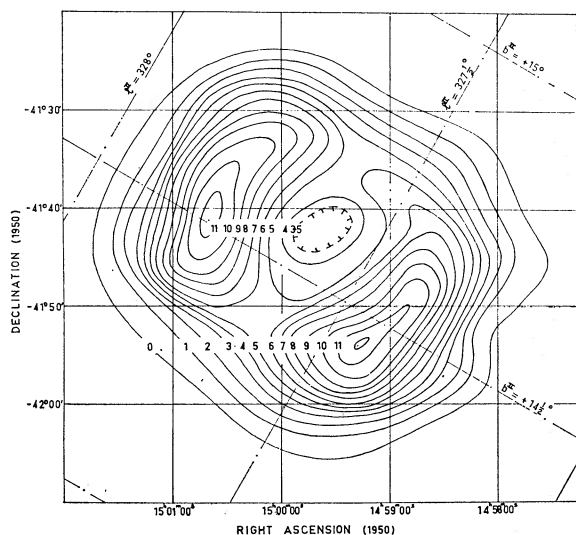


FIG. 1. Isophotes of the radio source 1459-41. The contour unit is 0.07°K antenna temperature.

SN 1006 AD, we made a careful survey of the region at a wavelength of 11 cm with the 210-ft telescope, which under the conditions of observation had a beamwidth of $8'$ arc. Isophotes of the source are shown in Fig. 1. Even though the source is a "double" to a first approximation, the detailed structure, with an intensity minimum near the center, is unlike that of extragalactic sources. It does, however, closely resemble the typical shell structure of many known supernova remnants.

Other radio evidence supporting the identification are the polarization, the spectral index and the galactic latitude. At 11 cm the linear polarization at each of the intensity maxima exceeds 10%. An estimate of the spectral index from the present 11-cm integrated flux density, the value quoted by Bolton, Gardner, and Mackey at 75 cm, and that of Mills, Slee, and Hill (1960) at 350 cm (the latter two corrected for beam broadening) gives a value of ~ -0.6 . The work of Harris (1962) would then suggest that the remnant is fairly young, that is of the order of 10^3 rather than 10^4 years, and probably of a Type II supernova. However, the surface brightness is considerably lower than expected for a spectral index of -0.6 in Harris' Fig. 5, and it is not possible to make an accurate estimate of distance. A relatively small distance is suggested by the comparatively high latitude of 15° . The rarity of supernovae at such a latitude favors the identification.

The location of the radio emission may make possible optical recognition of the remnant. A fuller discussion of the radio observations will be given elsewhere.

REFERENCES

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