

# THE FIRST IDENTIFICATIONS OF OBJECTS FOUND IN THE 2.695 GHz GALACTIC PLANE SURVEY

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**Abstract:** Nous avons trouvé des sources nombreuses dans le "survey" radioélectrique du plan galactique à la fréquence de 2.695 GHz. L'observation supplémentaire à 1.42 GHz, 4.75 GHz et 10 GHz permet de déterminer la nature des 10 sources par le spectre et la polarisation: 3 restes de supernovae, 5 régions-HII, un reste de supernovae couvert par la région-HII RCW 164, et une radiogalaxie.

One of the primary goals of the recently published 2.695 GHz survey of the galactic plane (Reich et al., 1984a) has been the detection and identification of structures like HII regions and supernova remnants (SNR). The inspection of the surveyed area includes discrete sources and extended objects. 21 discrete sources could be identified with planetary nebulae, 10 sources with known Wolf-Rayet stars. About 20 yet unidentified, unresolved sources are polarized at 2.695 GHz, therefore nonthermal. Further observations are planned to classify their galactic or extragalactic nature.

More than 30 extended objects have already been detected and studied. Four SNR's have been reported by Reich and Fürst (1984) and Reich et al. (1984b); one giant radio galaxy has been found by Seiradakis et al. (1985). Additional radio observations at 10 GHz (45-m telescope of the NRO) and at 1.42 GHz and 4.75 GHz (Effelsberg 100-m telescope) have allowed a determination of the nature of further 10 objects.

The radio maps at 4.75 GHz show the highest angular resolution of  $\approx 2.4$  arcmin and include linear polarization. The 1.42 GHz data are taken from the galactic plane survey presently being carried out at the MPIfR (Reich et al., in preparation). The position of the new sources and some relevant parameters are listed in Table 1.

From spectral and polarization information three sources have been found to be supernova remnants, five to be HII regions. G16.85-1.01 consists of a SNR partly obscured by the HII region RCW 164, G43.45+0.6 is probably a radio galaxy.

Contour maps of the three new SNR's are shown in Fig. 1a-c. G30.7+1.0 and G73.9+0.9 may be classified as "shell" or "combination" type SNR's (Weiler, 1983). G18.95-1.1 shows a very complex structure, consisting of various arcs pointing towards the central radio peak. High resolution observations are necessary to confirm the true nature of this object.

Table 1

| Source      | Flux density [Jy] |           |          |          | Integrated polarization<br>at 4.75 GHz<br>[%] | Spectral index<br>( $S_{\nu} \sim \nu^{\alpha}$ )<br>of integrated<br>flux density | Identification |
|-------------|-------------------|-----------|----------|----------|---|--|----------------|
|             | 1.42 GHz          | 2.695 GHz | 4.75 GHz | 10 GHz   |   |  |                |
| G 7.45+0.7  | 4.7±1.0           | 5.1±0.8   | 5.5±0.5  | —        | < 3   | 0.1 ± 0.2  | HII            |
| G16.85-1.05 | 5.3±1.1           | 6.4±0.7   | 7.4±1.2  | 7.6±0.8  | 15  | 0.2 ± 0.2  | HII + SNR      |
| G18.95-1.1  | 32.9±3.5          | 27.4±2.7  | 23.8±1.7 | 14.6±1.5 | 2.5   | -0.4 ± 0.1   | SNR            |
| G30.7 +1.0  | 5.1±0.7           | 4.1±0.6   | 3.4±0.4  | 2.7±0.5  | 32  | -0.4 ± 0.2   | SNR            |
| G43.45+0.5  | 3.6±1.2           | 3.8±1.1   | 3.5±1.1  | > 1.8    | < 1   | 0.0 ± 0.4  | radio galaxy   |
| G52.0 +0.6  | 20.9±2.0          | 16.6±1.6  | —        | 16.6±1.6 | —   | -0.1 ± 0.2   | HII            |
| G55.6 +0.7  | 2.2±0.3           | 1.8±0.2   | 1.8±0.2  | 1.8±0.3  | < 5   | 0.0 ± 0.2  | HII            |
| G61.7 +0.9  | 1.9±0.2           | 2.5±0.2   | 2.5±0.2  | 2.5±0.4  | < 1   | 0.0 ± 0.1*   | HII            |
| G73.9 +0.9  | 8.0±0.8           | 7.9±0.8   | 6.7±0.5  | 5.4±0.5  | < 6.3   | -0.2 ± 0.2   | SNR            |
| G75.4 -0.6  | 7.5±2.0           | 5.9±1.5   | —        | 6.2±0.8  | —   | -0.1 ± 0.2   | HII            |

\*) beyond  $\nu = 2.695$  GHz

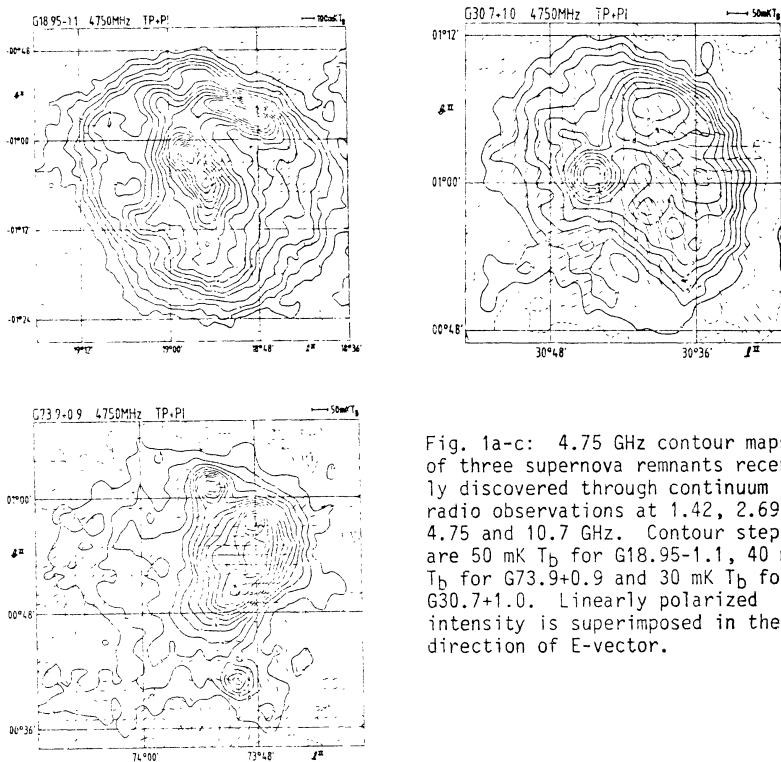


Fig. 1a-c: 4.75 GHz contour maps of three supernova remnants recently discovered through continuum radio observations at 1.42, 2.695, 4.75 and 10.7 GHz. Contour steps are 50 mK  $T_b$  for G18.95-1.1, 40 mK  $T_b$  for G73.9+0.9 and 30 mK  $T_b$  for G30.7+1.0. Linearly polarized intensity is superimposed in the direction of E-vector.

The work is being continued and further identifications of objects found in the 2.695 GHz survey will be reported elsewhere.

References

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