RADIO CONTINUUM OBSERVATIONS OF LARGE SUPERNOVA REMNANTS

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Radio observations of large supernova remnants (SNRs) with high angular resolution have been provided by modern synthesis instruments preferentially at frequencies below 2 GHz. Since these instruments are sensitive mainly to unresolved emission spots, weak extended SNRs usually remain undetected. Besides this, there are numerous physical parameters, which can be studied more properly at higher frequencies. In particular, the polarization characteristics can be more easily analyzed and reduced to the intrinsic magnetic field orientation. In some cases foreground effects substantially disturb the SNR's field structure at low frequencies.

The determination of the intrinsic magnetic field vectors serves as an essential prerequisite for a detailed examination of the interaction between interstellar matter/magnetic field and the supernova remnant. This interaction should be reflected in the morphology of the remnant.

Polarization and morphology of large (old) supernova remnants beyond 1 GHz can be easily observed with the 100-m telescope at Effelsberg. As a single dish the 100-m telescope is well suited to map extended areas of low surface brightness with high reliability. The natural advantage of single dish instruments lies in the fields of high dynamic range, high sensitivity, low spurious polarization, and a nearly unlimited field of view. Instrumental characteristics of the new 2.7 and 4.75 GHz receiver systems at Effelsberg are given in the table. Two

Frequency	4.75 GHz	2.7 GHz
Beamwidth	2.5 arcmin	4.5 arcmin
Bandwidth	500 MHz	50 MHz
System	3-channel paramp	3-channel FET
Mode	dual/single horn	single horn
Polarization	I,Q,U	I,Q,U
System noise temperature	65 K	60 K
Aperture efficiency	49%	55%
T_A(K) / S(Jy)	1.4	1.56

J. Danziger and P. Gorenstein (eds.), Supernova Remnants and their X-Ray Emission, 377–379.

examples of recently observed sources can be found in the figures which represent a small sample from a still running extensive observing program.

Besides the determination of morphology and polarization structure we intend to obtain high quality spectral index maps, which in connection with magnetic field estimations may serve as a test for acceleration models for energetic electrons as, for instance, the model proposed by Bell (1978).

Finally, we hope to find further large (old) remnants with bent radio spectra. In combination with small scale structures this might provide information on the compression rate of the radio emitting regions.

Bell, A.R.: 1978, Monthly Notices Roy. Astron. Soc. 182, pp. 147-156

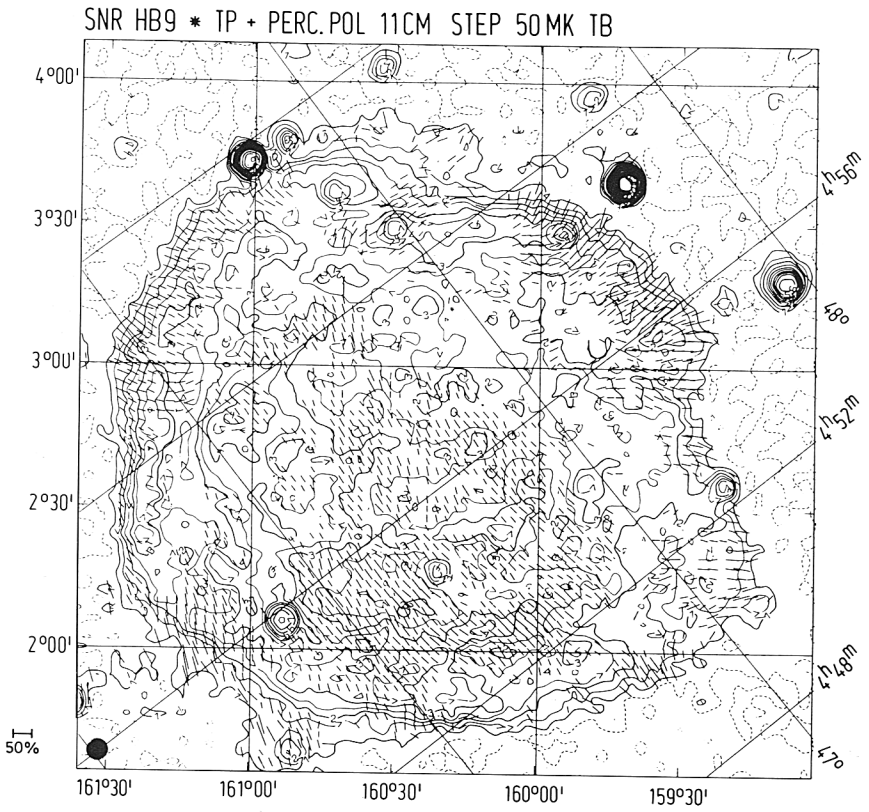

Fig. 1: 2.7 GHz observations of HB9 with the Effelsberg 100-m telescope with an angular resolution of 4!5. Contours run in steps of 50 mK T_B. Percentage polarization is represented by bars in the direction of the electric vector. Percentage polarizations are plotted above 15%.

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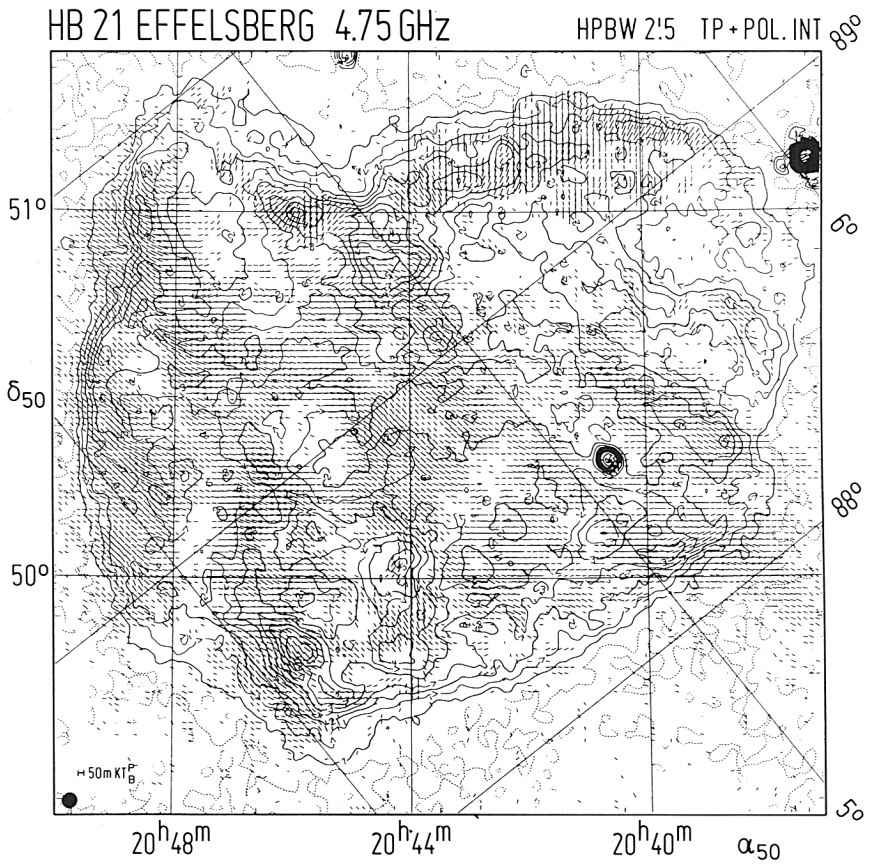

Fig. 2: 4.75 GHz observations of HB21 with the Effelsberg 100-m telescope with an angular resolution of 2'.5. Contours run in steps of 50 mK T_B. The polarized intensity is represented by bars in the direction of the electric vector.

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