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DISTRIBUTION AND KINEMATICS OF NEUTRAL HYDROGEN AROUND THE SNR G296.5+10.0

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HI 21cm line and radiocontinuum observations around the central frequency 1410 MHz, have been performed in a 9° x 6° area around the SNR G296.5+10.0, using the IAR 30m radiotelescope.

The continuum maps of the region, both at 408 MHz (Haslam et al.1981) and at 1410MHz (the present work), show the presence of a weak non-thermal source in the vicinity of G296.5+10. The source, hereafter called A, is likely to be a galactic supernova remnant. It is a"filled-center" type, approximately centered at l=300° , b=9°.15 , and about 1.3 kpc (lower limit)distant.

Concerning the neutral hydrogen distribution, several features can be recognized associated with the supernova remnants G296.5+10.0 and A. Namely: 1) A low density tunnel, approximately 140pc across, with an average volume density of 0.4 cm^{-3}, connects both SNRs; 2)A dense cold shell surrounds the depleted region ; 3) Extended vertical bands of neutral gas are placed between G296.5+10.0 and A, both at positive and negative velocities anomalous for circular rotating galactic gas, and 4) Small clouds in direction of G296.5+10.0 are present at high positive and negative velocities, also in "forbidden" ranges.

These data are plausibly described by Ikeuchi's (1978) model for two interacting supernovae, when both expanding shock fronts merge into a single "peanut"-shaped shell. Besides, the observed vertical HI bands, can be interpreted as the approaching and receding portions of the cold ring theoretically predicted in the region where the two individual shells overlap.

The mentioned small clouds associated with G296.5+10.0 may be the result of an interaction of the expanding supernova blast wave with pre-existing interstellar concentrations. With a mean expansion velocity of 30 km/s, the kinetic energy associated to these cloudlets turns out to be of the order of 1.3 x 10^{48} ergs, that is approximately 0.2% of the total initial energy E_o as estimated from the X-ray data (Tuohy et al. 1979). This energy fraction is in close agreement with other observed cases of small ambient clouds overtaken by SN shocks (See for example Landecker et al. 1980).

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