A SEARCH FOR OH EMISSION FROM THE MAGELLANIC CLOUDS*

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The rich variety and large number of HII regions in the Magellanic Clouds prompted a preliminary search for high-intensity anomalous OH emission similar to that observed in the direction of galactic HII regions (McGee *et al.* 1965; Weaver *et al.* 1965; Weinreb *et al.* 1965; Zuckerman, Lilley, and Penfield 1965). The two strongest emitters in the Galaxy are Sgr B_2 and W 49, the distances to which are 10 and 15 kpc (Akabane and Kerr 1965) respectively. It was estimated that at the distance of the Magellanic Clouds the emission from Sgr B_2 would be detectable and that from W 49 well above noise.

The Parkes 210 ft reflector was used with a frequency-switched multichannel radiometer in an attempt to detect line emission from the 20 brighest emission nebulae in the catalogue of Henize (1956). The velocity range searched was centred to cover the full spread of the optical and HI velocities (Feast 1963; McGee and Milton 1966) encountered at those positions. The observations were made in the period 19–24 May 1966 with a frequency resolution of 37 kHz and an average integration time of 15 min per source on each of the two major lines (1665 and 1667 MHz). Fourteen nebulae were observed in the LMC in the velocity range +140 to +400 km/sec, namely, N 11A, N 44, N 57, N 59, N 119, N 120, N 132, N 154, N 157, N 158, N 159, N 160, N 206, Radio Centroid (Mathewson and Healey 1964). Eight nebulae were observed in the SMC in the velocity range +30 to +310 km/sec, namely, N 12, N 22, N 36, N 37, N 50, N 66, N 76/78, Radio Centroid.

The r.m.s. noise fluctuations on the final record were less than or equal to 1 degK (T_a), and in no case was there any detectable signal (emission or absorption) significantly greater than noise. The continuum aerial temperature was in most cases below 5°K, and therefore limits could be put on the degree of absorption only for the following five nebulae:

Nebula:	N 157	N 158	N 159	N 160	Radio Centroid
τ	$<0{\cdot}07$	$<0{\cdot}5$	$<0{\cdot}4$	$<0{\cdot}5$	$<0{\cdot}06$

The number of HII regions observed in the present investigation is roughly half the number that have been studied in the Galaxy so far (Miller Goss, personal communication 1966; McGee, Gardner, and Robinson, personal communication 1967). On the basis of the negative results obtained here, clearly no significant conclusions can be drawn as to the abundance of OH in the Magellanic Clouds or as to the prevalence of conditions favouring anomalous emission. The intrinsic radio continuum output of W 49 is matched by three nebulae N 158, N 159, and N 160 and far exceeded by N 157 (30 Doradus). If this has any bearing on the likelihood of OH emission, it seems reasonable to suppose that a fresh search with increased sensitivity and frequency resolution might be successful.

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