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Radio Observations of the AGN and Gas in Low Surface Brightness Galaxies

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Abstract. LSB galaxies have low metallicities, diffuse stellar disks, and massive HI disks. We have detected molecular gas in two giant LSB galaxies, UGC 6614 and F568-6. A millimeter continuum source has been detected in UGC 6614 as well. At centimeter wavelengths we have detected and mapped the continuum emission from the giant LSB galaxy 1300+0144. The emission is extended about the nucleus and is most likely originating from the AGN in the galaxy. The HI gas distribution and velocity field in 1300+0144 was also mapped. The HI disk extends well beyond the optical disk and appears lopsided in the intensity maps.

Keywords. galaxies: ISM, galaxies: active, radio continuum: galaxies

1. CO Detection and Millimeter Continuum Emission Observations

We searched for CO(1–0) emission from seven LSB galaxies with BIMA. Three of the galaxies are large spirals; UGC 5709, UGC 6614 and F568-6 (Malin 2). The remaining four are relatively smaller galaxies with irregular disks: NGC 5585, UGC 4115, UGC 5209 and F583-1. The BIMA maps suggested the presence of CO(1–0) emission in two galaxies, UGC 6614 and F568-6. Using the IRAM 30m we detected molecular gas in the disks of both galaxies and in the nucleus of F568-6. These observations show that molecular gas in LSB galaxies is present in their disks as well as their nuclei, but the distribution is localized over isolated regions and hence difficult to detect. We have also detected mm continuum emission from the nucleus of UGC 6614. The emission has a flat spectrum in the 1.4 to 110 GHz range and is from the AGN in the galaxy (Das *et al.* 2006).

2. Centimeter Observations of 1300+0144

1300+0144 (or PGC045080) is a giant LSB galaxy close to edge-on and has a bright nucleus and faint bar. We have detected and mapped the radio continuum emission at 1.4 GHz, 610 Mhz and 320 MHz using the GMRT. The spectral index is -0.7 and the emission is extended about the nucleus. The emission is most likely due to the AGN and appears as lobes/jets; the core is not detected however and may be self absorbed. The HI gas distribution is asymmetric about the nucleus and appears lopsided. There is a dip in the HI distribution on the approaching side which is apparent in the HI map and spectrum. The disk rotation velocity flattens at ~ 200 km s^{-1}.

Acknowledgements

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References

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