Mapping the Hidden Universe: The Universe Behind the Milky Way – The Universe in H I
ASP Conference Series, Vol. 218, 2000
R.C. Kraan-Korteweg, P.A. Henning, and H. Andernach, eds.

H I Distribution in Blue Compact Dwarf Galaxies

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Abstract. We present VLA H I observations and preliminary results for two dwarf galaxies, Haro 2 (Mrk 33) and Haro 4 (Mrk 36), which are currently experiencing a burst of star formation. We analyze the distribution and kinematics of the neutral gas in order to relate the H I component to star formation events.

1. Introduction

Most recent work on the interstellar medium and its relation to star forming events has been focused on spiral galaxies. However, there are several advantages in studying these issues in dwarf galaxies as they are slow rotators, generally display solid body rotation and lack density waves, which simplifies their analysis. We present in this paper the neutral gas distribution and H I parameters for Haro 2 and Haro 4. We estimate the observed gas column density and compare this with the empirical threshold for star formation. The possibility of a correlation between this empirical threshold and metallicity is still a matter of debate; this makes the study of these H II galaxies of special interest, as they display low metallicities.

2. Observations

In November 1994 we devoted nine hours of the Very Large Array, in its C–configuration, to observe Haro 2 and Haro 4 in H I. To improve the sensitivity for low level, extended emission, these galaxies were reobserved in May 1995 for two hours in D–configuration. After combining the data we obtained a spatial resolution of around 14″, with a velocity resolution of 20.7 km s^{-1}. The observations reached a detection threshold of 3×10^6 $M_\odot$ for Haro 2, and 0.5×10^6 $M_\odot$ for Haro 4. The surface brightness sensitivity at 2.5 sigma is around 10^{20} cm^{-2} (for more details see Bravo-Alfaro et al. 2000).

and other dwarf galaxies" this work would not have been possible. We also thank the staff of the Calar Alto observatory for their support during the observations. This research has made use of the NASA/IPAC Extragalactic Database (NED), which is maintained by the Jet Propulsion Laboratory, Caltech, under contract with the National Aeronautics and Space Administration (NASA), of NASA's Astrophysical Data System Abstract Service (ADS) and of NASA's SkyView.

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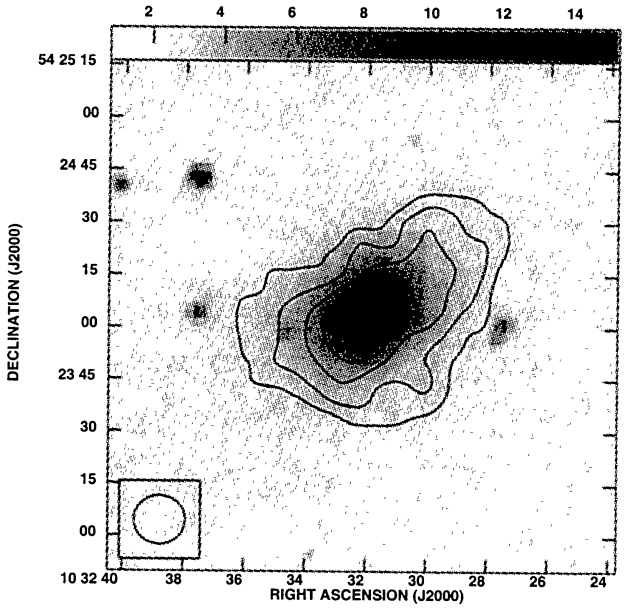

Figure 1. H I density distribution of Haro 2, superposed on a DSS B-band gray scale image. The contours are 1.2 (2.5 σ), 4.9, 9.8, 14.8, and 19.6×10^{20} cm^{-2}. The FWHM is indicated by the circle ($15.4'' \times 13.9''$).

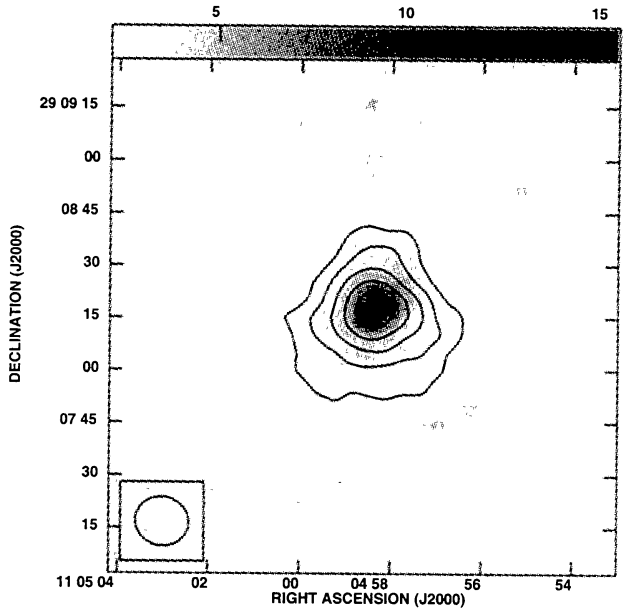

Figure 2. H I density distribution of Haro 4, superposed on a DSS B-band gray scale image. The contours are 1.2 (2.5 σ), 4.7, 9.4, 14.0, and 18.7×10^{20} cm^{-2}. The FWHM is indicated by the circle ($15.2'' \times 14.1''$).