

MULTI-WAVELENGTH STUDY OF THE GIANT BUBBLE IN CEPHEUS

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1. Introduction

The giant bubble in Cepheus was discovered by Kun et al. (1987) in the IRAS maps. It has an angular diameter of about 9° and connects several well-known star forming regions such as IC1396, S140, NGC7129. All these regions have nearly the same distances of about 800 pc permitting a good distance and linear size estimate for the bubble. Figure 1 shows the surface distribution of IRAS 100μ optical depths, obtained from the 60 and 100μ data and smoothed to the resolution of the HI survey. Although the bubble was discovered in the IRAS data base it is well pronounced in the integrated HI map obtained from the observations of Heiles & Habing (1974) and Weaver & Williams (1973). Figure 2 shows the HI line area map.

2. Results of the multivariate analysis

We analyzed the matrix built up from the mutual correlations between the HI channel maps. (We had altogether 39 channels in the $-30, +10$ km/s region, corresponding to a sampling frequency of 1 km/s). We used the principal components analysis to obtain non-correlated factors. (For further details of this technique see Murtagh and Heck (1987)). As a result of the principal components analysis we obtained 3 major factors describing 86 % of the variances of the observed maps.

Figure 3 shows the dependence of the factor coefficients on the radial velocity. Factor 1 peaks at large negative velocities, it can be treated as the background. Factor 2 peaks velocities close to 0, it mainly responsible for the foreground. We identified Factor 3 with the bubble itself. Figure 4 - 6 present the maps of the factor values.

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References

- Heiles, C., Habing, H.J. 1974, *A&AS* 14, 1
 Kun, M., Balázs, L.G., Tóth, I. 1987, *Aph. & Sp.Sc.*, 134, 211
 Murtagh, F., Heck, A. 1987, 'Multivariate Data Analysis', *Astrophys. Space Sci. Lib.*, 131. D. Reidel Publ. Co.
 Weaver, H., Williams, D.R.W. 1973, *A&AS* 8, 1

