

# A SEARCH FOR STARS IN THE MAGELLANIC STREAM

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## ABSTRACT

A search for faint stars (to  $20^m.5$  in B) in a bright part of the Magellanic Stream designated MSI by Mathewson (1976), carried out from automatic scans of UKST photographs by means of the COSMOS machine gives a negative result as far as the main HI cloud is concerned, but reveals a small surplus of images in a patch 1 degree away from the main HI concentration.

## OBSERVATIONS

The observational material consisted initially of a set of UKST plates on IIIaJ (blue) emulsion covering several degrees of sky on either side of the narrow MSI ridge. A photoelectric-electronographic sequence to  $22^m$  in B was set up to calibrate the plates. Various considerations resulted in the decision to terminate counts at  $20^m.5$  and also to confine our final analysis to an area of 24 square degrees which was observed on two and in part on three plates. Counts were made in squares of  $1 \text{ cm}^2$  on the plates ( $11.2 \times 11.2$ ).

## RESULTS

Average counts were  $\sim 60$  per square. A few squares had counts in excess of 80, all but one of which could be attributed by visual inspection to clusters of galaxies. Only one extended ( $\sim 0.1$  square degree) patch at ( $0^h 38^m, -44.1$ ) 1950 did not coincide with any obvious cluster of galaxies. The patch is  $1^\circ$  east of the main HI concentration and the excess equivalent to about 700 objects per square degree. At the actual position of the brightest HI contour there are in fact slightly fewer than average numbers. The result for MSI is therefore negative; the observed patch of surplus images constitutes at most a tentative identification.

## DISCUSSION

It is well established that the Large and Small Magellanic Clouds contain a high proportion of intermediate age stars ( $3 \times 10^7$  years) (e.g. Hawkins and Brück 1982; Brück 1984; Stryker and Butcher 1982). It can be argued that if the Magellanic Stream were in fact a tail drawn out from one of the Clouds during a relatively recent encounter with our Galaxy, as many theories suggest, the stars of the intermediate age group might well have accompanied the gas and might therefore be present in the Stream. Our failure to find such stars there is not a decisive result; it is paralleled by the absence of similar stars in the HI bridge joining the Large and Small Clouds (Brück 1982).

## CONCLUSION

A small patch with a low level of surplus faint images found  $1^\circ$  from MSI is the only possible location we have been able to identify of a stellar component in this part of the Magellanic Stream. The result is ambiguous; the patch could be a genuine part of the Stream at an undefined distance, in which case the stars and gas have become separated; an extended cluster of faint galaxies; or a fairly large fluctuation in local galactic star numbers. Only a colour magnitude diagram combined with a larger scale photograph will decide the nature of this group of images.

A detailed account of the work is in press (Brück and Hawkins 1983).

## REFERENCES

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