The Westerbork Survey of HI in Spiral Galaxies

(WHISP)

Observations proposed for 1994, first semester

1 September 1993

1 Introduction

WHISP is a survey of the neutral hydrogen component in spiral galaxies with the WSRT. Its aim is to obtain maps of the distribution and velocity structure of HI in 500 to 1000 galaxies. The results will serve as a basis for research in many areas, for example: dark halo's, the effects of environment on the structure and growth of HI disks, and galaxy distances. Further information on WHISP is given in our original observing proposal of 12 March 1992 (project WH 1103), that of 13 March 1993, and in the 'Project Report', dated 13 March 1993.

2 Observations done in 1992

In 1992 we requested 3 months of observing time for WHISP; four weeks were allocated. During this period 40 galaxies were observed for 12 hours; we also obtained shorter observations for a number of other galaxies.

3 Observations done in 1993

For 1993 we requested 3 months of observing time; four weeks in first priority and some filler time were allocated. It turned out that the filler time could only be used for short observations: the holes in the schedule were too small to do a full 12 hour observation. In this period 41 galaxies were observed for 12 hours. For about 20 galaxies we obtained 2 hour observations. *(CHECK!!!)*

4 Observations proposed for the first semester of 1994

We are now ready to start with the data reduction as planned originally (see below) and would therefore like to increase the rate at which the observations are being done to about 100 galaxies per year. Assuming that a 21-cm line period will be scheduled in each semester in 1994 we request for the first semester a block of time of 6 weeks (see section *Scheduling* below), or, alternatively an allocation of 50 times 12 hours.

Our priorities will largely be the same as in 1993 (excluding non-WHISP activities) and can be summarized as follows:

- From the UGC sample of galaxies with $\delta > 20°$ and blue diameters > 2.0 arcmin, we will first select galaxies with flux densities in excess of 200 mJy which have not yet been observed with the WSRT or the VLA (see Project Report). Nearly all of these galaxies lie within 1000 km/s, thus, in this way, we also contribute to the build-up of a volume-limited sample.
- We will also include a selection of high-luminosity galaxies that may have falling rotation curves.
- A number of egde-on systems will be included to study the occurrence warps. These edge-on systems will at the same time enlarge the sample of galaxies for which distances can be derived with the Tully-Fisher relation.
- Short observations will be done for a number of galaxies for which no HI fluxes are known. It appears that there are still many fairly large and bright galaxies without HI data. In part these short observations can be scheduled in hour-angle gaps between 12 hour observations (see below).

5 Scheduling

We regret the confusion that has arisen from the inclusion of non-WHISP observations in our proposal of 13 March 1993. We wish to emphasize that we too see those observations as a non-WHISP activity. As stated explicitly in the proposal they have been included to make optimum use of precious telescope time (see below). Therefore we do not agree with the 'umbrella' concept and with the statement that there is 'a slight but not insignificant drift from the originally stated aim of the project to one in which a more extended sample of galaxy types is to be studied' (Astron NFRA Newsletter **5**, 7).

The simplest way to solve this 'contamination' problem would be to allocate WHISP time on the basis of n times 12 hours. Then we would be able to use selection criteria that arise exclusively from the stated aims of WHISP. However, this would be a waste of telescope time, because large holes up to 8 hours would appear in the schedule. To a certain extent we have in WHISP the flexibility to choose galaxies at arbitrary right ascensions. Thus, we can replace candidate galaxy A by a candidate galaxy B at a different hour angle. In this way we can avoid wasting telescope time. Obviously, setting up a schedule in this way involves considerations like: 'if galaxy B is observed then galaxy A should *not* be observed' (and more complicated versions thereof), and planning in this manner can only be done in a responsible way by the WHISP project team.

An example of such a compact schedule is given in Figure 1; it represents the first two weeks of the 1993 observations. Note that the WHISP galaxies have been chosen in such a way that they form a continuous sequence in time with the Ursa Major galaxies of Verheijen, which occupy the central slot of 6 to 18 hours LST (NGC 6xxx, xxxx, ...). In the third and fourth week we have combined WHISP galaxies in a similar way with Ursa Major galaxies and with galaxies for which we wanted to obtain 2 hour observations.

Although in future we will have less flexibility in the selection of WHISP galaxies with regard to hour angle, it would be best if the WHISP project team were to know in advance which first priority non-WHISP galaxies will be scheduled.

6 Data Reduction

The position *Data manager* at the Kapteyn Institute has now been filled. Dr. Jurjen Kamphuis and Dolf Sijbring will share the position for an initial period of four years, and during that period they will work full time on the reduction of WHISP data. Both Kamphuis and Sijbring are experienced 21 cm line observers. Kamphuis has taken up his part of the position on August 15 and he has already made an energetic start; Sijbring will be appointed on November 1, after his PhD defense in October.

Braun and Howard are using the data of a number of WHISP galaxies observed in 1992 to study the relation between the kinematics of disks and nuclear starbursts.

Unfortunately ASTRON is extremely short of funds for OIO positions and no positions will be allocated in 1994. Fortunately the Kapteyn Institute has indicated that it will make a position available for WHISP on short notice and we hope to acquire a second AIO position soon. No suitable candidate has been found yet for the two year *Research Assistent / TWOIO* offered by ASTRON.

During the 1993 21-cm line period weekly visits to the WSRT were made by members of the project team, including Begeman, van der Hulst and van Albada. On each occasion maps have been made for a particular galaxy with NEWSTAR and the data have been inspected jointly with the WSRT staff. This has lead to a very useful exchange of information. Calibration and map making with NEWSTAR still have a number of shortcomings and we are grateful that Dr. Marco de Vos is available to modify NEWSTAR in accordance with the needs of 21-cm line observers.

7 Project team

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