1 Introduction

The Hamburg/ESO survey (HES; Wisotzki et al. 1996; Reimers & Wisotzki 1997; Wisotzki et al. 2000) is an objective-prism survey primarily targeting bright ($B_J > 17.5$) quasars. However, it was recognized right from the beginning (Reimers 1990) that the seeing-limited spectral resolution of the HES (~ 15 Å at Hγ) makes it possible to detect the strongest stellar absorption (or emission) features, so that the *stellar* content of the HES can be exploited systematically as well.

Below I give an overview of other ongoing or recently completed wide-angle surveys in the optical which aim at least partly at finding stars at high galactic latitude, and hence compete with the HES. In the sections of this thesis dealing with specific object types, I give more detailed comparisons of some of these surveys with the HES, and discuss their strengths and weaknesses.

The HK survey is a spectroscopic survey based on “narrow-band” objective prism plates, with a spectral range centered on Ca H+K (hence the name). It was conceived for searching field horizontal branch (FHB) and metal-poor stars at hight galactic latitude, in the northern and southern hemisphere (Beers et al. 1992*b*). Since the selection criterion for these stars was a weak or absent Ca K line, also many hot subdwarfs were discovered (Beers et al. 1992*a*). The faint limit of the HK survey is $B \simeq 15.5$.

The Montreal-Cambridge-Tololo survey (MCT) covers $6\,750\,\mathrm{deg}^2$ at $b < -30^\circ$ in the southern hemisphere with U and B plates taken with the 0.6 m Curtis Schmidt telescope (Demers et al. 1986; Lamontagne et al. 2000). It aims at providing a complete list of blue ($U-B < -0.6$) stellar objects down to $B \simeq 16.5$.

The Edinburgh-Cape survey (EC) is a photometric survey targeting UV-excess ($U-B < -0.4$) objects in the southern hemisphere (Stobie et al. 1997; Kilkenny et al. 1997). It was originally planned to cover $\sim 10\,000\,\mathrm{deg}^2$ at $|b| > 30^\circ$ and $\delta < 0^\circ$. However, it was recently decided that some of the more northern fields will *not* be done (O'Donoghue 1999, priv. comm.). The EC goes deeper than the MCT survey; i.e., down to $B \simeq 18$. However, follow-up spectroscopy and photometry is obtained for objects of $B \lesssim 16.5$ only.

The Hamburg Quasar Survey (HQS) is another digital, Hamburg-based objective prism survey. It was carried out in the northern hemisphere, using the Hamburg-Schmidt telescope on Calar Alto (Spain). The HQS covers $11\,000\,\mathrm{deg}^2$ at high galactic latitudes (Hagen et al. 1995). It is deeper than the HES ($B > 18.5$), but has a $\sim 3\times$ lower spectral resolution. Apart from many quasars, its main targets, also a lot of interesting stars have been found in the course of quasar candidate follow-up observations (e.g., Jordan et al. 1998; Dobrzycka et al. 1998; Reimers et al. 1999). There are attempts under way to calibrate the HQS plates more accurately than it is currently the case, and select white dwarfs with quantitative criteria (Homeier 1999, priv. comm.). However, stellar work is much more difficult than in the HES, because of the lower spectral resolution, and less homogenous plate material.

The APM C star survey is an extension of the APM[1] high-redshift quasar survey, aiming at a coverage of the total high-latitude sky ($|b| > 30^\circ$) in the northern and southern hemisphere (Totten & Irwin 1998). Cool carbon stars are selected in a $B_J - R$ colour-magnitude diagram. Limiting magnitudes are $B \simeq 20$ and $R \simeq 17$.

The Sloan Digital Sky Survey (SDSS) (see e.g. Gunn & Knapp 1993) is a deep ($V \lesssim 20$) CCD survey in the northern hemisphere. It is planned to cover ~ 10000 at high galactic latitudes with

[1]The acronym 'APM' refers to the Automatic Plate Measuring facility in Cambridge, UK.

photometry in five broad band filters. It uses the filter system $u'g'r'i'z'$ which is especially designed for the detection of high redshift quasars and galaxies, which are the primary targets. Simulations (Lenz et al. 1998) and first tests with real data (Margon & Szkody 1998) indicate that some stellar applications are feasible, too; e.g. selection of carbon stars, FHB/A stars, or CVs. However, Margon & Szkody (1998) show that a discrimination of metal-poor stars from the locus of normal stars is *not* possible in SDSS two-colour diagrams; on the other hand, Lenz et al. (1998) have developed refined methods that increase the metallicity separation for G-type stars. Metallicity separation *within* samples of stars at [Fe/H] < -2.0 becomes difficult especially for photometric surveys, since the change of broad-band colours with metallicity, caused by reduced line blocking in atmospheres of metal-poor stars, saturates at low metallicities. Hence, we can be curious about how efficient the SDSS can select metal-poor stars in practice.

In Sect. 2 I give a detailed description of the HES, including data reduction and plate calibration procedures. Sect. 3 deals with automatic spectral classification, one of the main selection techniques used for the exploitation of the stellar content of the HES. All remaining sections, with exception of Sect. 9, in which I give my conclusions, describe stellar applications of the HES. Finally, in Appendices A–C I list stars discovered in the course of projects carried out within my thesis work, and not listed in the sections describing the projects itself.

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