

The Kiso Survey for Ultraviolet-excess Galaxies (KUG)

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Abstract. KUG is a catalog of ultraviolet-excess galaxies which have been detected on two- or three-color Kiso Schmidt plates. From 1984 to 1993, the first KUG survey selected 8104 objects in about 5100 square degrees, and the second KUG has already selected 1642 objects in about 300 square degrees. We present a combined list of both surveys, together with its analyses comparing other catalogs and databases.

1. Introduction

The KUG survey has begun 1984 as a project of selecting ultraviolet(UV)-excess galaxies and compiling a catalog, with the Kiso 105-cm Schmidt telescope, by B. Takase and N. Miyauchi-Isobe. Its first series has been compiled into a catalog (by CDS, VII/179A) listing 8104 objects in about 5100 square degrees (Takase & Miyauchi-Isobe 1993).

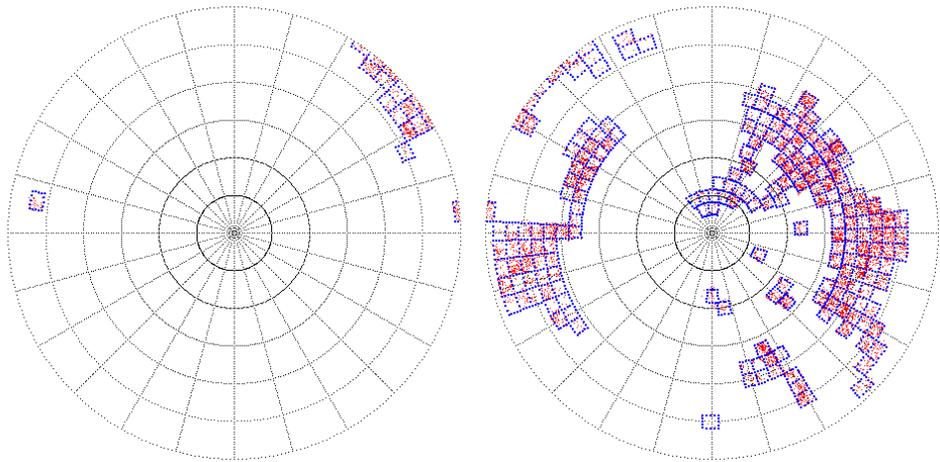


Figure 1. KUG survey areas.

It was succeeded by its second series project, by N. Miyauchi-Isobe and H. Maehara, and the second one has already selected 1642 objects in about 300 square degrees (Miyauchi-Isobe & Maehara 2003).

In the course of follow-up observations of KUGs (e.g., Maehara et al. 1987, Tomita et al. 1997), it is clarified that the majority of them are spiral or irregular galaxies with intense star formation in their nuclei, bars, disks, or outer regions. These samples give us clues to the understanding of triggering mechanism of star formation, and of the evolution of some types of galaxies. In addition, Seyferts, LINERs, and active galaxies with some peculiarities are included as minor groups of KUGs, being a fainter extension of Markarian galaxies.

The whole surveyed areas and selected objects are shown in Figure 1 (Right map – northern hemisphere, its left end – 0h of right ascension, and its top – 6h).

The KUGs are detected on the ultraviolet(U) and red(R) double exposed 103a-E plates, as bluer galaxies than A-type stars, by eye-inspection. The catalog contains the positions, the brightness, and the morphological types which are eye-estimated in the Palomar Sky Survey Print (PSS).

The second survey will continue until finishing 14 areas already taken on the Schmidt plates.

2. Preliminary comparison with the SDSS DR1 catalog

Recently the SDSS Data Release 1 (DR1) has been published (Abazajian et al. 2003). It contains a catalog of galaxies in which the objects were determined by a software pipeline (Lupton et al. 2001). It seems worth comparing these results, one is determined by eye-inspection and the other by software algorithm.

Figure 2 shows the KUG objects (red dots), and SDSS DR1 galaxies (blue dots) which are sampled in accordance with the magnitude and color ranges of KUGs.

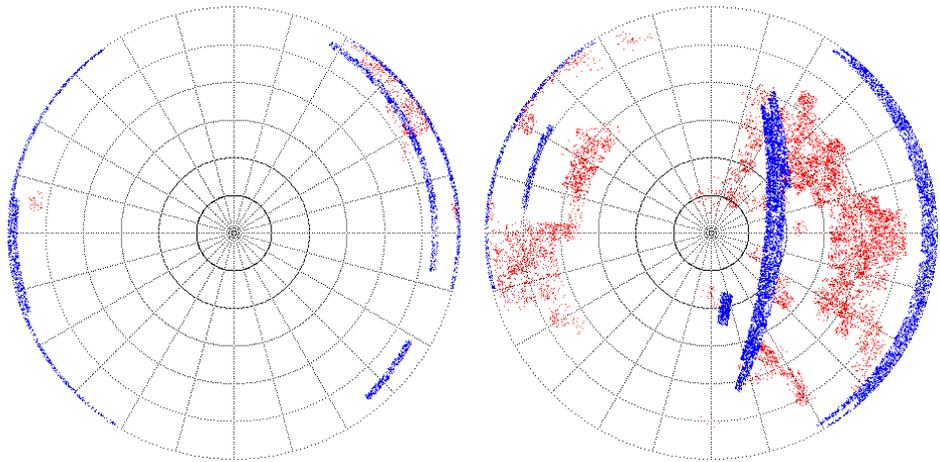


Figure 2. SDSS DR1 galaxies over KUG objects.

A sample figure of overlapping areas is shown in Figure 3. The area is A0225 of Kiso division system, whose right ascension and declination limits are shown below. Red squares denote KUG objects, and blue dots SDSS galaxies.

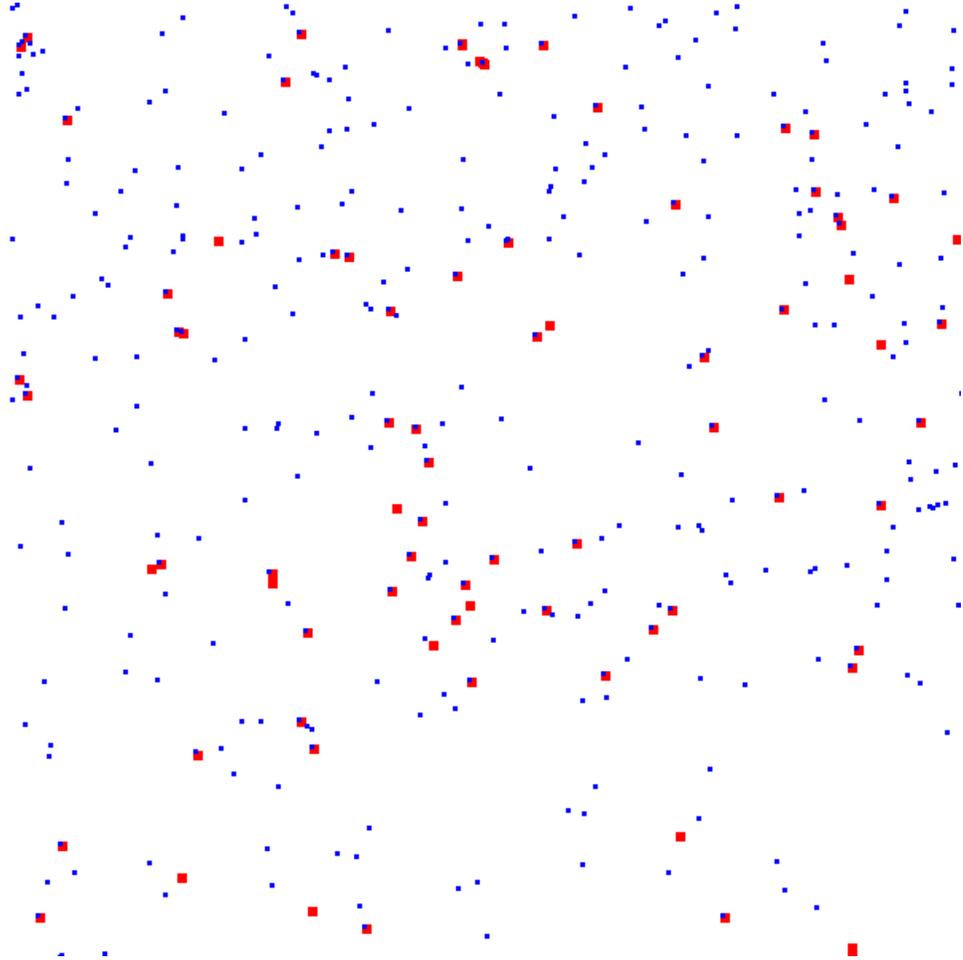


Figure 3. SDSS DR1 galaxies over KUG objects in A0225 area.

In plotting the figure, we first select SDSS's u, g, r data of galaxies whose positions coincide with those of KUGs, and then examine their magnitude and color (i.e. $u - g$ and $g - r$) ranges statistically.

Taking account of these ranges, we select the SDSS galaxies from the database by `sqlcl.py` script. Adopted SQL instructions are as follows:

```
SELECT  ra, dec, u, g, r, i, z FROM Galaxy
WHERE   (g>11.3) and (g<17.5) and
        (g-r>0.2) and (g-r<0.9) and
        (u-g>0.5) and (u-g<2.0) and
        (ra>128.9) and (ra<137.5) and
        (dec>47.1) and (dec<52.7)
```

3. Discussion

As seen in Figure 3, there are lots of SDSS galaxies not identified as KUG objects. Inspecting these unidentified objects on our Schmidt plates and on DSS-II database, we will be able to investigate the characteristics of algorithm used in SDSS galaxy selection, from the eye-inspecting points of view.

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References

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