

MASTER CATALOGUE FOR THE SPECTRUM-UV PROJECT

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Abstract. The primary astronomical catalog of the Spectrum-UV mission is briefly discussed. We describe the main constituents of the catalog and the merging procedures used for the compilation and implementation of the Spectrum-UV Master Catalogue (MC).

Key words: space vehicles – catalogs

1. OVERVIEW OF THE SPECTRUM-UV MISSION

The Spectrum-UV mission is aimed at observations in the ultraviolet spectral range with the T-170 telescope (aperture 170 cm). The telescope will be carried into an extremely eccentric 7-day orbit. The Spectrum-UV scientific payload includes a high-resolution spectrograph ($\lambda = 110\text{--}350$ nm, $R = 60000$, 48000, 500 in different subranges), a Rowland spectrograph ($\lambda 90\text{--}400$ nm, $R = 10000$, 3000, 300), a field camera with a focal length of 17 and 170 m and a field of view of 4 arcmin and 24 arcsec, respectively. The Spectrum-UV telescope will be used in the “observatory” mode. The observation program will be compiled from proposals submitted by scientists of any nationality or affiliation. For the scheduling of observations, a 6 month planning cycle is envisaged. The observation time will be allocated by an international allocation committee. Observations (scheduling, pointing and guiding) will be supported by a specialized tool (Master Catalogue – MC), which must meet the Spectrum-UV constraints and should be compiled on the basis of the best presently available astronomical catalogs.

The launch of the Spectrum-UV observatory is planned for 1999. Its operation period is expected to be not less than 3 years.

2. SPECTRUM-UV FINE GUIDANCE SYSTEM (FGS) AND MC

The Spectrum-UV fine guidance system should provide a telescope pointing and stabilization with an accuracy of better than 0.16 arcsec during at least 30 hours. The FGS includes two optical units containing CCD detectors with a field of view of 8.5 arcmin and a distance between the field centers of 20 arcmin. The integration time for a 15 mag object with $S/N \approx 10$ is 0.2 sec. The FGS imposes strict requirements on the MC, e.g. the relatively small field of view of the FGS must be compensated for by an increase of the density of guiding stars in the catalog.

3. SPECTRUM-UV MASTER CATALOGUE

3.1. *The purpose*

The MC will be used for the planning of observations (selection of guiding stars) and support (identification of guiding stars and providing an error signal).

3.2. *General requirements*

The MC must provide at least two guiding stars within the field of view with a probability of 0.85 or higher and the most accurate data on the coordinates and brightness of the objects. Unreliable objects (variables, fast moving or extended sources) should be flagged in the MC. The basic data (coordinates, brightness, type) must be provided for all MC objects, whereas specific objects must be supplied with additional information (proper motions for known "fast-moving" stars, amplitudes, periods, etc. for variable stars, parameters of visual pairs, data on nonstellar objects, etc).

3.3. *Astronomical constituents*

We intend to compile the MC on the basis of two large present day catalogs: the SAI Astrographic Catalogue and a modified GSC catalog. In addition, the MC will contain data from a number of general astronomical catalogs.

3.3.1. SAI Astrographic Catalogue (SAI-AC)

The SAI Astrographic Catalogue was created at the Sternberg Astronomical Institute (SAI), Moscow, during the past several years. It is based on the Carte du Ciel Astrographic Catalogues and contains accurate positions and proper motions for about 4.5 million stars down to 12.5 magnitude. The accuracy of SAI-AC positions is 0.2–0.4 arcsec. Proper motions of the SAI-AC stars have been derived by comparing Carte du Ciel positions (average epoch about 1900) with those of GSC (average epoch about 1980) and have a typical accuracy of 4–6 mas/year. It should be pointed out that the SAI-AC is a unique catalog in its size, completeness and accuracy; the reader is referred to the presentation by Kuimov et al. (1997) in this colloquium for more details about the SAI-AC.

3.3.2. Guide Star Catalogue (GSC)

We will use the GSC catalog to extend MC to the faint SAI-AC magnitude limit. The direct use of the GSC is difficult due to several reasons (the primary one is the lack of cross-identifications with general astronomical catalogs). This drawback of the GSC will be eliminated as a result of joint efforts of the SAI and INASAN working groups.

3.3.3. Supplementary data for the MC

The requirements discussed above (Section 3.2) could not be met by using only the SAI-AC and the GSC without including data from other catalogs. The necessary cross-identifications for the SAI-AC are either already completed (HD, PPM) or planned by the SAI and INASAN groups. Other important catalogs (CCDM/IDS, GCVS), which include fainter stars, will be cross identified with both the SAI-AC and the GSC. For cross identification of the GSC with known nonstellar objects, we plan to use data from the NED database. When necessary, the SIMBAD database will also be involved.

The MC catalog will be a part of the “Spectrum-UV” Astronomical Information Database (SUV-AID) maintained by INASAN. The Master Catalogue should be released for “Spectrum-UV” applications in 1998 (one year before the launch).

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REFERENCES

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