Mem. S.A.It. Vol. 77, 1176

Memorie della

A library of synthetic galaxy spectra for GAIA comparison with SDSS

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Abstract. The ESA cornerstone mission GAIA will acquire spectrophotometric observations of a large number of unresolved galaxies. An integral part of the data analysis task is the preparation of a library of galaxy spectra, suitable for the classification and parameterization of the observed objects. An extended grid of synthetic galaxy spectra has been created, using the code PÉGASE.2 (Fioc M. & Rocca-Volmerange B.,1997, A&A, 326, 950), which is based on models of galaxy evolutionary synthesis and the BaSeL stellar spectral library. The library contains about 4000 zero-redshift spectra, in the wavelength range 250 to 1050 nm and at 1 nm or less resolution, and covers the main (Hubble) types of galaxies, at a regular grid of four key astrophysical parameters for each type and at intermediate random values of the same parameters. In addition, the library is produced for various redshifts. This synthetic library has been compared with real spectra obtained from SDSS. We have produced colour-colour diagrams based on simulated colors from both the synthetic PÉGASE.2 (Fioc M. & Rocca-Volmerange B.,1999, A&A, 351, 869; Le Borgne D. & Rocca-Volmerange B. 2002, A&A, 386, 446) and the real SDSS spectra. The agreement is very good at the full range of galaxy types.

Key words. Galaxies: fundamental parameters – Techniques: photometric – Techniques: spectroscopic

1. Acknowledgments

The authors would like to thank the E.L.K.E. of the University of Athens and the Greek General Secretariat of Research & Technology for financial support.