Mem. S.A.It. Vol. 77, 1171

Memorie della

The SDSS-I Value-Added Catalog of stellar parameters and the SEGUE pipeline

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Abstract. We report on the development, calibration, and refinement of the SDSS-I Value Added Catalog (VAC) of stellar abundances, temperatures, and surface gravities. This catalog is based on observations of several hundred thousand stars obtained during the course of the original Sloan Digital Sky Survey, now known as SDSS-I. A spectroscopic pipeline has been developed that obtains estimates of [Fe/H], $T_{\rm eff}$, and log g based on medium-resolution (R = 2000) spectra and *ugriz* photometry obtained with the ARC 2.5m telescope. This same pipeline is being used for estimation of stellar parameters for the ongoing SEGUE: Sloan Extension for Galactic Understanding and Exploration project. We discuss the methods explored for development of the VAC, as well as tests of the calibration based on high-resolution spectroscopy obtained with the Hobby-Eberly Telescope, the Keck telescopes, and the Subaru telescope. Based on the existing high-resolution data, the offsets and scatter of the atmospheric parameters obtained from the present pipeline are, respectively – [Fe/H]: +0.04 ±0.18 dex, $T_{\rm eff}$: +17.0 ±114 K, and log g: +0.03 ±0.33 dex. These results, which are quite encouraging, may degrade somewhat as the parameter space for which high-resolution data presently exists is expanded to include stars of higher and lower effective temperatures.

Key words. Stars: abundances – Stars: Population II – Galaxy: abundance

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