Astrophysics > Instrumentation and Methods for Astrophysics

Precision Spectrophotometry at the Level of 0.1%

Renbin Yan

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Accurate relative spectrophotometry is critical for many science applications. Small wavelength scale residuals in the flux calibration can significantly impact the measurements of weak emission and absorption features in the spectra. Using Sloan Digital Sky Survey data, we demonstrate that the average spectra of carefully selected red-sequence galaxies can be used as a spectroscopic standard to improve the relative spectrophotometry precision to 0.1% on small wavelength scales (from a few to hundreds of Angstroms). We achieve this precision by comparing stacked spectra across tiny redshift intervals. The redshift intervals must be small enough that any systematic stellar population evolution is minimized and less than the spectrophotometric uncertainty. This purely empirical technique does not require any theoretical knowledge of true galaxy spectra. It can be applied to all large spectroscopic galaxy redshift surveys that sample a large number of galaxies in a uniform population.

Comments:	7 pages, 6 figures; submitted to AJ. The derived correction vector is provided in the ancillary data file. v2: minor corrections matching the accepted version
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