

Photometric Redshifts in the Hawaii-Hubble Deep Field-North

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Abstract. We derive z_{phot} for sources in the entire ($\sim 0.4 \text{ deg}^2$) H-HDF-N field with the EAzy code, based on PSF-matched broadband (U band to IRAC $4.5 \mu\text{m}$) photometry. Our catalog consists of a total of 131,678 sources. We find $\sigma_{\text{NMAD}} = 0.029$ for non-X-ray sources. We also classify each object as a star or galaxy through SED fitting. Furthermore, we match our catalog with the 2 Ms CDF-N main X-ray catalog. For the 462 matched non-stellar X-ray sources, we improve their z_{phot} quality ($\sigma_{\text{NMAD}} = 0.035$) by adding three additional AGN templates. We make our photometry and z_{phot} catalog publicly available.

Keywords. catalogs — galaxies: distances and redshifts — galaxies: evolution — surveys

There are > 3000 z_{spec} and enormous multiwavelength data in the $\sim 0.4 \text{ deg}^2$ H-HDF-N field (see Fig.(a)), which covers HDF-N, GOODS-N, CANDELS, and CDF-N. We utilize the EAzy code to derive z_{phot} with PSF-matched broadband photometry, adopting 8 galaxy templates for non-X-ray sources (see Fig.(b)), 3 additional AGN templates for X-ray sources, and a linear combination of these templates. Our z_{phot} quality shows overall improvements over relevant previous works, with $\sigma_{\text{NMAD}} = 0.029$ (0.035) and an outlier fraction of 5.5% (12.5%) for non-X-ray (X-ray) sources (see Figs.(c-e)). We release photometry and z_{phot} catalog of 131,678 sources publicly.

