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Photometric Redshift Calibration of the Dark Energy Survey

Friday, 16 August 2013 15:18 (24 minutes)

During fall 2012 the Dark Energy Survey (DES) collaboration installed and commissioned DECam, a 570 mega-pixel optical and near-infrared camera with a large 3 sq. deg. field of view, set at the prime focus of the 4-meter Blanco telescope in CTIO, Chile. In the course of the next five years DECam will map an entire octant of the southern sky to unprecedented depth, measuring the position on the sky, photometric redshift (photo-z) and shape of over 200 million galaxies, together with thousands of galaxy clusters and supernovae. With this data set, DES will study the properties of dark energy using four main probes: galaxy clustering on large scales, weak gravitational lensing, galaxy-cluster abundance, and supernova distances.

A "Science Verification" (SV) period of observations, lasting until late February 2013, followed the DECam commissioning phase, and provided science-quality images for about 150 sq. deg. at the nominal depth of the survey. During the SV period, four ~1 sq. deg. fields with extensive spectroscopic coverage were observed, resulting in close to a million galaxies with DECam 5-band photometry, with over 15,000 of them having secure spectroscopical redshift information. This sample has been used to characterize the precision of several photo-z algorithms, also providing estimates for the true spectroscopic redshift distribution in several photo-z bins, which is needed for galaxy clustering and weak lensing tomographic studies in the main DES-SV galaxy sample. The talk will present the result using the current four photo-z calibration fields, and will summarize the plans and prospects for the photo-z calibration of the whole DES survey.

APS member ID

60031070

Primary author: Prof. HONSCHEID, Klaus (Ohio State University)

Presenter: Prof. HONSCHEID, Klaus (Ohio State University)

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