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We present the Dark Energy Camera All Data Everywhere (DECADE) weak lensing dataset: a catalog of 107 million galaxies observed by the Dark Energy Camera (DECam) within the northern Galactic cap. This catalog was assembled from public DECam knowledge together with survey and normal observing programs. These information were consistently processed with the Dark Energy Survey Data Management pipeline as part of the DECADE campaign and function the basis of the DECam Local Volume Exploration survey (DELVE) Early Data Release three (EDR3). We apply the Metacalibration measurement algorithm to generate and calibrate galaxy shapes. We present a collection of detailed studies to characterize the catalog, measure any residual systematic biases, and confirm that the catalog is suitable for cosmology analyses. Despite the considerably inhomogeneous nature of the data set, because of it being an amalgamation of various observing programs, we find the resulting catalog has adequate quality to yield competitive cosmological constraints.

Measurements of weak gravitational lensing - the deflection of light from distant sources by the intervening matter distribution between the source and the observer - provide vital constraints on the expansion, evolution, and matter distribution of the Universe (Bartelmann & Schneider 2001; Schneider 2005). The cosmological lensing impact, which is determined by the gravitational potential subject, [Wood Ranger Power Shears order now](#) Ranger Power Shears for sale is seeded by the entire matter distribution of our Universe. Thus, weak lensing is directly sensitive to all matter elements, including those that don't emit/absorb light and would otherwise be unobservable. This makes lensing a strong probe of the underlying construction of the Universe (see Bartelmann & Schneider 2001, for a review of weak gravitational lensing) and of any processes that influence this structure; together with modified gravity (e.g., Schmidt 2008), primordial signatures (e.g., Anbajagane et al. 2024c; Goldstein et al. 2024), in addition to a large variety of astrophysical impacts (e.g., Chisari et al. 2018; Schneider et al.

2019; Aricò et al. 2021; Grandis et al. 2024; Bigwood et al. 2024; Anbajagane et al. Since the first detection of weak lensing greater than two a long time in the past (Bacon et al. 2000; Kaiser et al. 2000; Wittman et al. 2000), the cosmology group has invested vital effort in rising the statistical energy of, and lowering the systematic biases in, these measurements. At the center of these advances are more and more larger and better-quality datasets, which have persistently grown in sky coverage, depth, and image high quality. The neighborhood has now developed from the early weak lensing surveys that have a couple of million source galaxies¹¹¹Throughout this work, we follow widespread nomenclature utilized by the group in referring to galaxies used within the weak lensing measurement as "source galaxies", such as the Canada-France-Hawaii Telescope Lensing Survey (CFHTLenS, Heymans et al. 2013) and the Deep Lens Survey (DLS, Jee et al. 2013), [hedge trimming shears](#) to current Stage-III²²²The "Stage-N" terminology was launched in Albrecht et al.

2006) to explain the different phases of darkish power experiments. There are at the moment 4 phases, the place Stage-III refers back to the dark energy experiments that began in the 2010s and Stage-IV refers to people who start in the 2020s. surveys which have tens to a hundred million supply galaxies, [hedge trimming shears](#) such as the Kilo-Degree Survey (KiDS, de Jong et al. 2015), the Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP, Aihara et al. 2018), and the Dark Energy Survey (DES, DES Collaboration et al. 2018). Other datasets, such because the Ultra-violet NearInfrared Optical Northern Survey (UNIONS) are also constructing supply-galaxy catalogs (Guinot et al. 2022). Within the near future, we anticipate to observe more than a billion supply galaxies with the Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST, LSST Science Collaboration et al. 2009). Alongside increases in the statistical power of surveys, there have been significant advances within the methodologies used to measure the shapes of a large number of faint, distant galaxies (e.g., Bridle et al.

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