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# The Dark Energy Survey Supernova Program: Light curves and 5-Year data release

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# Abstract

We present griz photometric light curves for the full 5 years of the Dark Energy Survey Supernova program (DES-SN), obtained with both forced Point Spread Function (PSF) photometry on Difference Images (DIFFIMG) performed during survey operations, and Scene Modelling Photometry (SMP) on search images processed after the survey. This release contains 31,636 DIFFIMG and 19,706 high-quality SMP light curves, the latter of which contains 1635 photometrically-classified supernovae that pass cosmology quality cuts. This sample spans the largest redshift ( $z$ ) range ever covered by a single SN survey ( $0.1 < z < 1.13$ ) and is the largest single sample from a single instrument of SNe ever used for cosmological constraints. We describe in detail the improvements made to obtain the final DES-SN photometry and provide a comparison to what was used in the DES-SN3YR spectroscopically-confirmed SN Ia sample. We also include a comparative analysis of the performance of the SMP photometry with respect to the real-time DIFFIMG forced photometry and find that SMP photometry is more precise, more accurate, and less sensitive to the host-galaxy surface brightness anomaly. The public release of the light curves and ancillary data can be found at <https://github.com/des-science/DES-SN5YR>. Finally, we discuss implications for future transient surveys, such as the forthcoming Vera Rubin Observatory Legacy Survey of Space and Time (LSST).

