

## New Perspectives



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# Finding the selection function for DES galaxy-galaxy strong lenses

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Strong lensing is a powerful probe into the mass distributions—and the evolutionary histories—of galaxies and galaxy clusters. However, in studies using strong lenses to probe galaxy structure, we need to assess whether strong lenses are representative of the general galaxy population or they form a biased subsample. We carry out an investigation into selection biases potentially present in a sample of 98 galaxy-galaxy strong lens candidates, identified in Dark Energy Survey (DES) Year 3 imaging. We model the surface brightness profile for all galaxies in this sample and in a sample of 3990 non-lensing luminous red galaxies (LRGs) from the DES Year 3 red-sequence Matched-filter Galaxy Catalog (redMaGiC). Statistical comparisons between the two populations through Kolmogorov-Smirnov (K-S) testing are then performed using a set of photometric observables from our model posteriors. In early results, we report statistically significant differences between the two populations in several observables. Most notably, the lensing galaxies may be larger in projected size and slightly brighter than non-lensing LRGs on average. This result is congruent with simple predictions of how strong lensing occurs. The brighter and more massive galaxies will provide more lensing cross-section and thus more opportunities for strong lensing to occur. We are working to improve our techniques for lens-source deblending, in order to include more strong lensing candidates in our sample of lensing galaxies.

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