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Gravitational lensing with a twist: E and B-modes in the Lynx deep field ANDREW BRADSHAW, University of California, Davis, JAMES JEE, Yonsei University, TONY TYSON, University of California, Davis — In the single thin-lens approximation for gravitational lensing, correlations in the galaxy shear field can simply be described by the gradient of the projected surface mass density along the line of sight. Thus only E-modes are produced through lensing, and typically any nonzero observed B-modes (curl component of the field) are attributed to systematic errors in the observing or data analysis. However, as we show, under realistic observing conditions the shear field can have an observable B-mode. Here we present a deep, multi-band galaxy shape photometric redshift catalog going out to a redshift of z 2 (B/V/R/i/z 26th magnitude) in the Lynx field, which is rich with galaxy clusters around redshift of z 0.5. Multiple clusters in the field are detected as peaks in the E-mode map, and are subsequently cataloged and simulated. Additionally, we present and speculate on our detection of observed B-modes which are observed in multiple bands shape catalogs and in non-zero shape correlation functions.

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