우주론

[구 CO-01] Intrinsic alignments of emission line galaxies at z ~1.4 from the FastSound redshift survey

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Intrinsic alignments (IA), the coherent alignment of intrinsic galaxy orientations, can be a source of a systematic error of weak lensing surveys. The redshift evolution of IA also contains information about the physics of galaxy formation and evolution. We present the first measurement of IA at high redshift, z~1.4, using the spectroscopic catalog of blue star-forming galaxies of the FastSound redshift survey, with the galaxy shape information from the Canada-Hawaii-France telescope lensing survey. The IA signal is consistent with zero with power-law amplitudes fitted to the projected correlation functions for density-shape and shape-shape correlation components, $A_{\delta+}=-0.0040\pm 0.0754$ and $A_{++}=-0.0159\pm 0.0271$, respectively. These results are consistent with those obtained from blue galaxies at lower redshifts (e.g., $A_{\delta+}=0.0035_{-0.0389}^{+0.0387}$ and $A_{++}=0.0045_{-0.0168}^{+0.0166}$ at z=0.51 from the WiggleZ survey), suggesting no strong redshift evolution of IA. The upper limit of the constrained IA amplitude corresponds to a few percent contamination to the weak-lensing shear power spectrum, resulting in systematic uncertainties on the cosmological parameter estimations by $-0.035<\Delta \sigma_8<0.026$ and $-0.025<\Delta \Omega_{\mathrm m}<0.019$

[구 CO-02] Barionic Acoustic Oscillations with 3-point Correlation Function of Quasars

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While quasars are sparse in number density, they reside at relatively high-redshift as compared to e.g. luminous red galaxies. Hence, they are likely to be less non-linearly evolved than the galaxy population, and thus have a distribution that more closely mirrors the primordial density field. Therefore, they offer an intriguing opportunity to search for Baryonic Acoustic Oscillations (BAO). To this end, the 3-point correlation function (3PCF) is an excellent statistical tool to detect BAO. In this work, we will make the first-ever measurement of the large-scale quasar 3PCF from the SDSS-IV DR14 quasar sample (spanning the largest volume to-date). This work will use the order *N*2-time 3PCF algorithmof Slepian & Eisenstein (2015), with N the number of objects.

[구 CO-03] Cosmological parameter constraints from galaxy-galaxy lensing with the Deep Lens Survey

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The Deep Lens Survey (DLS), a precursor to the Large Synoptic Survey Telescope (LSST), is a 20 deg2 survey carried out with NOAO's Blanco and Mayalltelescopes. DLS is unique in its depth reaching down to ~27th mags in BVRz bands. This enables a broad redshift baseline and is optimal for investigating cosmological evolution of the large scale structure.

Galaxy-galaxylensing is a powerful tool to estimate averaged matter distribution around lensgalaxies by measuring shape distortions of background galaxies. The signal fromgalaxy-galaxy lensing is sensitive not only to galaxy halo properties, but also to cosmological environment at large scales. In this study, we measure galaxy-galaxy lensing and galaxy clustering, which together put strong constraints on thecosmological parameters.

We obtain significant galaxy-galaxy lensing signals out to ~20 Mpc while tightly controlling systematics. The B-mode signals are consistent with zero. Our lens-source flip test indicates that minimal systematic errors are present in DLS photometric redshifts. Shear calibration is performed using high-fidelity galaxy image simulations. We demonstrate that the overall shape of the galaxy-galaxy lensing signal is well described by the halo model comprised of central and non-central halo contributions. Finally, we present our preliminary constraints on the matter