

## X12a Fundamental plane of quiescent galaxies in high-density environment at $z = 2$

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We present the first measurement of the fundamental plane of massive quiescent galaxies at  $z = 2$  in high-density environment. We obtained deep MOSFIRE spectra of quiescent galaxies in a proto-cluster at  $z = 2.2$  and securely detected absorption lines and measured their velocity dispersion. Using morphological measurements from the HST data, we infer the dynamical mass of the quiescent galaxies. We find that the dynamical mass of galaxies in high-density environment is offset with respect to the field galaxies in the sense that proto-cluster galaxies are dynamically more massive at a given stellar mass. This is driven by larger sizes of proto-cluster galaxies than field galaxies at the same epoch. The fundamental plane also seems to be offset and cluster galaxies appear to be more evolved than their field counterparts. We discuss implications of these trends for the formation of massive galaxies at high redshifts.