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Cosmology with kinematic Sunyaev-Zel'dovich effect measurements from ACTPol and future surveys. FRANCESCO DE BERNARDIS, Cornell University — ACTPol is the first polarization receiver for the Atacama Cosmology Telescope (ACT) that is observing the CMB sky with arcmin resolution over about 2000 sq. deg. Its upgrade, Advanced ACTPol, will observe the CMB in five frequency bands and over a larger area of the sky. These measurements will enable a number of astrophysical and cosmological studies. We focus on the kinematic SZ effect as measured through the mean pairwise momentum of galaxy clusters. The spectroscopic information is particularly valuable for these measurements and ACTPol is in a unique position for this kind of study due to its wide overlap with the Baryon Oscillation Spectroscopic Survey (BOSS). The pairwise kSZ signal is able to probe the growth and expansion history of the universe. Moreover, measurements of the kSZ effect can be used to test advanced hydrodynamical simulations of the Intra-Cluster Medium (ICM) and to constrain the baryon content of galaxy clusters. We report the latest kSZ results from ACTPol and BOSS and describe the potential strong constraints on cosmological parameters and practical challenges in the extraction and maximization of the signal-to-noise ratio. We discuss the main sources of systematic uncertainty and the progress towards realistic forecasts for future CMB instruments.

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