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Baryon Acoustic Oscillations in the BOSS Quasar - Lyman Alpha Forest Cross-Correlation CARL MICHAEL BLOMQVIST, University of California Irvine, BARYON OSCILLATION SPECTROSCOPIC SURVEY (BOSS) COLLABORATION — I will present the measurement of the baryon acoustic oscillation (BAO) scale at redshift $z = 2.4$ from the correlated clustering of quasars and the intergalactic medium. The study utilizes the spectra of 190,000 high-redshift quasars ($z > 2$) from the Baryon Oscillation Spectroscopic Survey (BOSS), publicly available through Data Release 12 of the Sloan Digital Sky Survey III. From the measurement of BAO in the cross-correlation of the density of quasars with the Lyman alpha forest absorption, we are able to determine the the expansion rate of the Universe 11 billion years ago and the angular diameter distance with an accuracy of nearly 3%. By combining the results from the cross-correlation and the Lyman alpha forest auto-correlation, the precision in the measurement of the expansion rate and the angular diameter distance is improved to 2% and 3% accuracy, respectively.

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