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## Quasar-Lyman $\alpha$ Forest Cross-Correlation from SDSS-III BOSS survey: Baryon Acoustic Oscillations

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We measure the large-scale cross-correlation of quasars with the Lyman-alpha forest absorption field. We use over 170,000 forests from Data Release 12 (DR12) of the SDSS-III BOSS survey and over 240,000 quasars from DR12 and from DR7 of the SDSS-II survey. This study allows us to measure the Baryonic Acoustic Oscillation (BAO) scale, along and across the line of sight, at a mean redshift of  $z = 2.40$ . These scales are linked to the Hubble parameter and the angular diameter distance, respectively. We produced a set of 100 Gaussian random field simulations. The covariance of the set is found to agree with the covariance matrix calculated from the data. We use these simulations to search for a possible bias in the measurement of the BAO scale.

**Auteur principal:** M. DU MAS DES BOURBOUX, Héliion (CEA, Saclay)

**Orateur:** M. DU MAS DES BOURBOUX, Héliion (CEA, Saclay)

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