

Galaxy correlations at the smallest scales

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(on behalf of the Alhambra team)

The ALHAMBRA (Advanced Large Homogeneous Area Medium-Band Redshift Astronomical) Survey (Molino et al. 2013) is a photometric survey covering 2.8 deg^2 in 7 independent fields in the sky, to a depth of $I_{AB} \sim 24.5$. It uses a photometric system based on 20 contiguous optical filters $\sim 300\text{\AA}$, combining them with JHK_s imaging. The observations have been carried out with the Calar Alto 3.5m telescope. The filters have been specially designed to maximize the effective depth of the survey and to obtain very accurate photometric redshifts and spectral-type classification, providing a catalog with homogeneous selection function with redshift, extremely useful for galaxy evolution studies. The fields overlap with ancillary data (COSMOS, DEEP2, SDSS), enabling detailed testing of the photo-z procedure. Multicolor photometry and photometric redshifts are provided for $\sim 438,000$ galaxies with precisions of $\delta_z/(1+z) = 1\%$ for $I_{AB} < 22.5$ and $\delta_z/(1+z) = 1.4\%$ for $22.5 < I_{AB} < 24.5$.

The depth and the accuracy of the redshifts in the ALHAMBRA survey makes this catalogue an optimal dataset to study the evolution of the clustering of galaxies down to very small scales ($r \sim 20 h^{-1}\text{kpc}$), only limited by the seeing. We have studied this small-scale clustering in order to constrain the distribution of satellite galaxies inside dark matter haloes and to test standard models for their radial density profiles up to redshift $z \sim 1$.