

“CMB Cross-correlation WG”

Key projects for Euclid Project Definition Document

https://euclid.roe.ac.uk/projects/cxswg/wiki/Key_Projects_Page

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Pre-launch KP

Plan & SWG EPDD prepared Jan.-Sept. 2019 by the WG available on Redmine

- Forecasts for CMBX
 - Fisher-based forecasts (**To finish!**)
 - Extended & realistic forecasts (link with SPV activities)
- Mocks for CMBX
 - Mock simulations for CMB/LSS cross-correlation
- Estimators for CMBX analyses
 - Estimators of the ISW-galaxy cross-correlation
 - Estimators for the tSZ/CMB lensing x cosmic shear
 - Estimators for the tSZ/CMB lensing x galaxy clustering
 - Estimators for the reconstruction of kSZ signal

→ **Pre-Launch KP under review. Speed-up the activities**

Post-Launch Analysis KP

- ISW measurement & Imprints of LSS on large scale CMB
 - ISW-g measurement
 - Constraints on the ISW via Angular Redshift Fluctuations
 - ISW measurement through clusters
 - Imprint of superstructures by stacking voids and superclusters in the CMB (with Galaxy clustering & Clusters WG)
- CMB lensing cross-correlation with Euclid observables
 - CMB lensing-g measurement
 - CMB lensing-shear measurement
- Search and characterisation of hot gas via tSZ cross-correlation with Euclid observables
 - tSZ cross-correlation with Euclid galaxies
 - tSZ cross-correlation with Euclid lensing signal
 - Scaling relation for tSZ detected clusters

Post-Launch Analysis KP

- Peculiar velocities from CMB cross-correlation with Euclid
 - Constraints on the kSZ effect with angular redshift fluctuations
 - Measuring pairwise velocities
 - Constraints on the peculiar momentum via correlations of squared CMB fluctuations with Euclid observable
 - Probing LSS transverse velocity field using gravitational potential time variation

→ **Prioritise the Post-Launch KPs and assess their feasibility**

END