

N-body Simulations of the Rees-Sciama Effect

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Abstract Using N -body cosmological simulations, we compute the derivative of the potential along the line of sight in order to estimate the integrated Sachs–Wolfe (ISW) effect and the Rees–Sciama (R-S) effect on CMB maps. By using the same seed to generate the initial conditions and changing the spatial and mass resolution we study the impact of numerical resolution on the predicted results. As expected, the ISW is affected less than the R-S. We compute the angular power spectrum and compare it with the corresponding one for the CMB fluctuations and find that the ISW plus R-S power spectrum is well below the level of CMB fluctuations. This is however affected by the relative small size of our simulation. Future and larger simulations will be able to probe larger scales and to higher redshifts.

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