Backreaction from inhomogeneities and late time cosmological evolution

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The presently accelerating universe is observed to contain inhomogeneities at various levels up to very large scales. Backreaction due to such inhomogeneities on the global metric continues to grow with time as a result of structure formation. We compute the effect of backreation from inhomogeneities on the future evolution of the universe using the Buchert formalism for obtaining the global metric based on averaging over time-like hypersurfaces. We find that the effect of inhomogeneities leads to the slowing down of acceleration with time. For a range of model parameters, the acceleration can vanish at a finite future time, leading to the universe entering another decelerating era. A scalar field analogy of the model in terms of the morphon framework enables the use of cosmological data such as SNIa, CMBR and LSS to impose constraints on the model parameters.