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The bulk flow in üΛCDM and XCDM and the Hubble constant and σ_8 tensions

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Abstract
The standard model of cosmology, ΛCDM, has been successful in describing many observations. With the improvement of the number and the accuracy of observations, some inconsistencies among key cosmological parameters of the model have emerged. Many alternative models are proposed to alleviate these tensions. On the other hand, some observations of peculiar velocity show higher values than expected in a ΛCDM universe which may contradict the cosmological principle. In this work, we used linear perturbation theory to measure bulk flow and $f\sigma_8$ parameter in two alternative cosmological models üΛCDM and XCDM. We compared measured bulk flows with the ΛCDM predictions and some observations. We did a χ^2 analysis to see which model is preferred by data. We find that üΛCDM model predicts higher bulk flows and is more consistent with observational data but does not reduce σ_8 tension. Bulk flows measured in the XCDM model are lower compared to ΛCDM . However, this model can reconcile σ_8 tension.
Keywords: structure formation, cosmological perturbation theory, bulk flow, cosmological tensions

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