PAINEL 19

STRUCTURE FORMATION IN DARK MATTER/ENERGY DOMINATED UNIVERSES

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In this work we present preliminary results of an analysis on the evolution of primordial baryonic and dark matter density perturbations. A top-hat hydrodynamic code has been utilized to analyze the evolution of these primordial perturbations, from beginning of the recombination era until the redshift when the collapse occurs. All the relevant processes are included in the calculations, which includes the effect of a dark energy in the expanding universe. In particular, we find that the perturbations with dark matter collapse at very high redshift, which could explain the existence of old galaxies at high redshift. As a general result we find that the distribution of the non-baryonic dark matter is more concentrated than the baryonic one.

PAINEL 20

SEARCH FOR THE SUNYAEV-ZELDOVICH EFFECT IN THE WMAP DATA USING THE DPOSS CLUSTER CATALOG

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The Sunyaev-Zeldovich (SZ) effect is a secondary Cosmic Microwave Background (CMB) anisotropy and is a very powerful tool to probe the mass distribuition in large scales (~ tens to hundreds of Mpc). It offers some advantages compared to optical or X-ray imaging, such as the good detection efficiency at high redshifts, a mass detection threshold as a function of redshift and the fact it is a robust quantity if compared to any thermal structure in the intracluster gas. In this work we present the results of the search for the SZ effect in the WMAP 3-yr maps, in the Q, V and W bands, which are a combination of the individual detectors in each band. We also used the 3-year ILC (Internal Linear Combination) map, which combines the 5 WMAP bands (K, Ka, Q, V and W), and the coadded Q+V+W maps, which is a combination weighted by the number of observations per pixel in the sky. The cluster candidates were selected from the DPOSS (Palomar Digital Sky Survey) cluster catalog and their positions are cross-correlated with the WMAP data in order to look for SZ signatures. From about 16000 candidates, our first analysis selected objects using two criteria:

increasing values of richness, from 30 to 120, and a redshift cut, choosing objects in the interval $0.07<z<0.2$. These selection criteria produced a list of about 2600 candidates for richness >30 and about 200 candidates for richness >60. We computed the average temperature of pixels within a ring around the coldest pixel, centered in the coordinates of each object with richness >60. For each object, a temperature profile as a function of the distance from the central pixel was generated. We were able to produce a few tens of clean profiles and calculated the $(\Delta T/T)_{SZ}$ dip for each one. The average SZ dip for the DPOSS candidates which had their profiles measured is about -0.3 mK and we have not detected temperature decrements in more than 50% of the candidates. Although the WMAP point spread function has not been included in the data analysis up to this point, it will be considered in forthcoming steps. In this work we will present the $(\Delta T/T)_{SZ}$ profiles obtained from the WMAP data using the list of cluster candidates from the DPOSS catalog.

PAINEL 21

SUPERNOVAE AND CMB CONSTRAINTS ON PHENOMENOLOGICAL MODELS OF QUARTESSENCE

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In recent years, the possibility of having a single component accounting for the phenomenology associated to dark energy and dark matter has been considered. Several models of such unifying dark matter - also known as quartessence - were proposed, the most popular being the Chaplygin Gas. In this work, we consider four phenomenological models of quartessence: the Generalized Chaplygin Gas, Exponential Quartessence, Logarithmic Quartessence, and Step-like Quartessence. These models are consistent with the large-scale matter power spectrum from 2dF and SDSS data for a particular type of initial intrinsic entropy perturbations. We use the Riess et al. "gold" type Ia supernovae (SNIa) sample in combination with the positions of the first three peaks, and the first valley in the cosmic microwave background radiation (CMBR) power spectrum from WMAP and BOOMERANG2003, and recently released WMAP06 (three year data) to set constraints on these models. We also consider the Modified-Born-Infeld model for a scalar field that also acts as unifying-dark-matter. Assuming a flat universe and big-bang nucleosynthesis constraints on the baryon density, we determine the confidence regions of the model's two (one for the Born-Infeld model) free parameters using a Chi-squared analysis. It is found that these six models are consistent with the data for a wide parameter range, that includes the ΛCDM model 2σ.