general random non-Gaussian field in order to quantify small deviations from Gaussianity. Our main assumption is that the fluctuation field has a mixed probability density function (PDF) of the form: $P(\delta) = (1-\alpha)f_1(\delta) + \alpha f_2(\delta)$, where: a) f_1 is the probability distribution of an adiabatic Gaussian field, b) f_2 is the probability distribution of a general random non-Gaussian field and c) α is a mixing parameter which allows us to modulate the contribution of each component to the resultant field. From the above PDF, we derive the correlation function between high density peaks for small deviations from Gaussianity. We show how this mixed correlation function can be applied to Cosmic Microwave Background data to search for possible deviations of a Gaussian signature in the statistical properties of the temperature fluctuations.

PAINEL 8

GAMMA-RAY BURSTS DEMOGRAPHY FROM THE SAMPLE WITH KNOWN REDSHIFTS

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Gamma-ray Bursts (GRB) are the most energetic events in nature on short time-scales, being second only to the Big-Bang itself. The mechanism for generating the enormous radiant energy output (with isotropic peak luminosities in excess of 10^{52} erg/s) is not fully understood, but there may be a connection with supernova events. The number of GRB with known redshifts is now large enough for statistical studies to be carried out. In this contribution we examine the constraints that can be put on the luminosity function of GRB and their space distribution by examining the predictions of simple models and comparing them to the observed redshift distribution, the observed $\log N \times \log S$ diagram and the observed distribution of luminosities. Preliminarly, we have verified that strong evolution effects are needed to explain the redshift distribution, both for the single luminosity case (as if GRB were standard candles) or spread luminosity functions. The evolution term has the form $(1+z)^{\alpha}$ with $\alpha \approx 3.5$. One key point in our analysis is that we chose the smoothest possible functionals to describe both the luminosity function and space distribution. This is important since there is a clear evidence for a bimodal distribution of peak luminosities. This work was supported by FAPESP 01/14527-3.

PAINEL 9

DEFLATIONARY COSMOLOGY: CONSTRAINTS FROM ANGULAR SIZE AND AGES OF GLOBULAR CLUSTERS

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Observational constraints to a large class of decaying vacuum cosmologies are derived using the angular size data of compact radio-sources and the latest age estimates of globular clusters. For this class of deflationary $\Lambda(t)$ models, the present value of the vacuum energy density is quantified by a positive β parameter smaller than unity. In the case of milliarcsecond compact radio-sources, we find that the allowed intervals for β and the matter density parameter Ω_m are heavily dependent on the value of the mean projected linear size l. Constraints from age estimates of globular clusters and old high redshift galaxies are not so restrictive, thereby suggesting that there is no age crisis for this kind of $\Lambda(t)$ cosmologies.

PAINEL 10

A TIME VARYING SPEED OF LIGHT FOR A MODIFIED VACUUM

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In the last few years, several cosmologies with time variation of the speed of light, c, have been proposed. In these schemes, the functional dependence of c with time is either imposed or obtained through the use of scalar fields (analogous to what happens with G in the Brans-Dicke theory). A consequence of such approach is that the form of the equations of Electrodynamics must be altered. In the present work, we derive a form for the time variation of c for a vacuum with time dependent electric permittivity and magnetic permeability, whereas requiring the validity of Maxwell Electrodynamics. We show that some forms for the time variation of c, that have been postulated in the literature, may be justified in our approach. By imposing some simmetry conditions on the electromagnetic wave equations, the time dependence of c is determined. The solution for these wave equations are derivated and compared with the classical results.