os modelos cosmológicos levam em conta apenas os termos cinéticos, esquecendo-se dos chamados termos dinâmicos (termos de interação. Usualmente, as interações entre os constituintes do universo têm somente o papel de termalização do sitema e eventualmente de produção de novos elementos (nucleossíntese). Em nenhum momento as interações entram como *fonte direta de gravitação*. Neste trabalho pretendemos explicitar a falta dos termos dinâmicos nos modelos cosmológicos usuais, relacionados com equações de estado, e nos modelos cosmológicos perturbativos, relacionados com as funções de distribuição. Baseado na ME interagente são propostos também métodos de como incluir estes termos na cosmolgia. Por fim, pretende-se construir um modelo de brinquedo para exemplificar a influência dos termos de interação. Neste modelo vamos supor que o universo é constituido de fótons usuais e nucleons clássicos interagentes. Utilizando então a teoria dos ensembles construiremos a equação de estado para este sistema e mostraremos que os termos de interação desta equação afetam diretamente o fator de escala do universo, podendo inclusive, sob certas extrapolações, gerar um período de expansão acelerada para o universo primordial

PAINEL 7

MASS VARIANCE IN THE CONTEXT OF NEARLY GAUSSIAN COSMOLOGICAL

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Galaxy clusters are the largest virialized structures in the Universe. The study of their abundance as a function of the redshift can impose important constraints on the linear amplitude of mass fluctuations. To find the number of clusters in any given redshift interval, one needs to know their comoving density $n(z)$. This may be predicted using the semi-analytic formalism of Press & Schechter (1974). In this model (and most of its variants) the space density of a given type of object exponentially depends on the rms dispersion in mass, σ_M, and also on the growth factor for the linear perturbation, $D(z)$. In the case of rich galaxy clusters, the linearized Abell radius (1.5 h^{-1} Mpc) is ~8h^{-1} Mpc and, hence, σ_M on this scale can be determined from the observational abundance of these objects, becoming the so-called σ_8 parameter. The exponential dependence in the PS formula comes from the underlying hyrpothesis of a Gaussian distribution for the density fluctuations field. Such a dependence can be more or less intense if this distribution is not Gaussian. We investigate the behaviour of the mass variance and the mass function of galaxy clusters in the context of a nearly Gaussian model. By asssuming that the statistics of the density field is built as a weighted mixture of two components, we find a relation between the mass variance at 8 h^{-1} Mpc scale, σ_8, and the parameter controlling the Gaussian deviation in the model, α_0. This result, in conjunction with observational constraints on the mass variance and high-z galaxy clustering, suggests a scenario where structures develop earlier in comparison to strictly Gaussian models even for $\alpha_0 \leq 1.6\times10^{-4}$. Our model also indicates that X-ray galaxy clusters with $z \gtrsim 1.4$ may discriminate between Gaussian and non-Gaussian models.

PAINEL 8

A SCALAR FIELD DESCRIPTION FOR THE COSMOLOGICAL VACUUM DECAY

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The so-called dark energy is believed to be the first observational evidence for new physics beyond the domain of the Standard Model of Particle Physics. However, in spite of its fundamental importance for an actual understanding of the evolution of the Universe, the nature of this unknown energy component constitutes one of the greatest mysteries of modern Cosmology and nothing but the fact that it has a negative pressure (and that its energy density is of the order of the critical density, ~10^{-29} g/cm^3) is known thus far. In this work we study theoretical and observational aspects of the vacuum decay scenario, as proposed in Refs. [1,2], in which a time-varying cosmological term accounts for the dark component responsable for the current cosmic acceleration. By using the method developed in Ref. [3], we discuss a scalar field description for this process of vacuum decay. We also investigate some observational features of this model and place constraints on its parameters from current observations of type Ia supernova, cosmic microwave background and large scale structure.

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PAINEL 9

DARK ENERGY CONSTRAINTS FROM GEMINI DEEP DEEP SURVEY

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Dark energy is the invisible fuel that seems to drive the current acceleration of the Universe. Its presence, which is inferred from an impressive convergence of