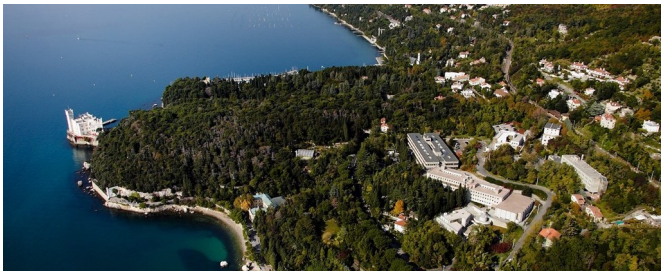

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Chaotic scalar fields as a model of dark energy in a generalized entropy setting

Monday 28 August 2023 22:35 (5 minutes)

Motivated by the recent developments of cosmological models that are based on generalized entropies rather than Boltzmann-Gibbs entropy, we consider stochastically quantized self-interacting scalar fields as suitable models for dark energy. These fields shift information and effectively maximize Tsallis entropy with entropic index q=3. Second quantization effects lead to new and unexpected phenomena if the self-interaction strength is strong. The stochastically quantized dynamics can degenerate to a chaotic dynamics conjugated to a Bernoulli shift in fictitious time, and the right amount of late-time dark energy density can be generated without fine-tuning. It is numerically shown that the scalar field dynamics distinguishes fundamental standard model parameters as corresponding to local minima in the dark energy landscape. Chaotic fields of this type can offer possible solutions to the cosmological coincidence problem, and give sense to late-time dark energy as stabilizing standard model parameters in the vacuum energy landscape. C. Beck, Phys. Rev. D 69, 123515 (2004) J. Yan and C. Beck, Entropy 24, 1671 (2022)

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