

General Relativity and Quantum Cosmology

Explaining Holographic Dark Energy

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(Submitted on 25 Jan 2010)

The physical origin of holographic dark energy (HDE) is reexamined. It is shown that the well-accepted explanation in terms of the UV/IR connection argument of Cohen et al is wrong. Moreover, Thomas's bulk holography argument, which is considered as another physical basis of the HDE model, is not consistent with observations either. A new conjecture is then proposed to explain the HDE model. It is suggested that the dark energy of the universe may originate from the quantum fluctuations of space-time limited in the event horizon of the universe. The energy density of such fluctuations is shown to assume the same form as that in the HDE model. Moreover, both theoretical considerations and latest observations suggest ρ_{HDE} is approximately $\sqrt{\pi}/2$.

Comments: 10 pages, no figures

Subjects: **General Relativity and Quantum Cosmology (gr-qc)**Cite as: **arXiv:1001.4567v1 [gr-qc]**

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From: Sheldon Gao [[view email](#)]**[v1]** Mon, 25 Jan 2010 23:31:40 GMT (77kb)*[Which authors of this paper are endorsers?](#)*Link back to: [arXiv](#), [form interface](#), [contact](#).

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