General Relativity and Quantum Cosmology

The quantum interest conjecture in (3+1)-dimensional Minkowski space

Gabriel Abreu (Victoria University of Wellington), Matt Visser (Victoria University of Wellington)

(Submitted on 7 Jan 2010)

The quantum inequalities, and the closely related quantum interest conjecture, impose restrictions on the distribution of the energy density measured by any time-like observer, potentially preventing the existence of exotic phenomena such as Alcubierre warp-drives or traversable wormholes. It has already been proved that both assertions can be reduced to statements concerning the existence or non-existence of bound states of a certain 1-dimensional quantum mechanical Hamiltonian. Using this approach, we will informally review a simple variational proof of one version of the Quantum Interest conjecture in (3+1)-dimensional Minkowski space.

Comments:	3 pages. Prepared for the proceedings of the 12th Marcel Grossmann conference. (Paris, July 2009.)
Subjects:	**General Relativity and Quantum Cosmology (gr-qc)**
Cite as:	**arXiv:1001.1180v1 [gr-qc]**

Submission history

From: Gabriel Abreu [view email]
[v1] Thu, 7 Jan 2010 23:18:19 GMT (17kb)

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