Cornell University Library

We gratefully acknowledge supp
the Simons Fo
and member ins

arXiv.org > math-ph > arXiv:1206.1562

Search or Article-id

(Help | Advance

All papers

Mathematical Physics

On a Recent Construction of "Vacuum-like" Quantum Field States in Curved Spacetime

Christopher J. Fewster, Rainer Verch

(Submitted on 7 Jun 2012 (v1), last revised 31 Aug 2012 (this version, v2))

Afshordi, Aslanbeigi and Sorkin have recently proposed a construction of a distinguished "S-J state" for scalar field theory in (bounded regions of) general curved spacetimes. We establish rigorously that the proposal is well-defined on globally hyperbolic spacetimes or spacetime regions that can be embedded as relatively compact subsets of other globally hyperbolic spacetimes, and also show that, whenever the proposal is well-defined, it yields a pure quasifree state. However, by explicitly considering portions of ultrastatic spacetimes, we show that the S-J state is not in general a Hadamard state. In the specific case where the Cauchy surface is a round 3-sphere, we prove that the representation induced by the S-J state is generally not unitarily equivalent to that of a Hadamard state, and indeed that the representations induced by S-J states on nested regions of the ultrastatic spacetime also fail to be unitarily equivalent in general. The implications of these results are discussed.

Comments:	25pp, LaTeX. v2 References added, typos corrected. To appear in Class Quantum Gravity
Subjects:	**Mathematical Physics (math-ph)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Theory (hep-th)
Cite as:	**arXiv:1206.1562 [math-ph]**
	(or **arXiv:1206.1562v2 [math-ph]** for this version)

Submission history

From: Christopher J. Fewster [view email]
[v1] Thu, 7 Jun 2012 17:53:05 GMT (30kb)
[v2] Fri, 31 Aug 2012 12:53:06 GMT (30kb)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.

Download:

- PDF
- PostScript
- Other formats

Current browse cont

math-ph
< prev | next >
new | recent | 1206

Change to browse b

gr-qc
hep-th
math

References & Citatio

- NASA ADS

Bookmark(what is this?)

ScienceWISE