

Quantum Physics

Svetlichny's inequality and genuine tripartite nonlocality in three-qubit pure states

Ashok Ajoy, Pranaw Rungta

(Submitted on 4 Jan 2009 (v1), last revised 14 Nov 2009 (this version, v2))

The violation of the Svetlichny's inequality (SI) [Phys. Rev. D, 35, 3066 (1987)] is sufficient but not necessary for genuine tripartite nonlocal correlations. Here we quantify the relationship between tripartite entanglement and the maximum expectation value of the Svetlichny operator (which is bounded from above by the inequality) for the two inequivalent subclasses of pure three-qubit states: the GHZ-class and the W-class. We show that the maximum for the GHZ-class states reduces to Mermin's inequality [Phys. Rev. Lett. 65, 1838 (1990)] modulo a constant factor, and although it is a function of the three tangle and the residual concurrence, large number of states don't violate the inequality. We further show that by design SI is more suitable as a measure of genuine tripartite nonlocality between the three qubits in the the W-class states, and the maximum is a certain function of the bipartite entanglement (the concurrence) of the three reduced states, and only when their certain sum attains a certain threshold value, they violate the inequality.

Comments: Modified version, 5 pages, 2 figures, REVTeX4

Subjects: **Quantum Physics (quant-ph)**Cite as: **arXiv:0901.0368v2 [quant-ph]**

Submission history

From: Pranaw Rungta [[view email](#)]**[v1]** Sun, 4 Jan 2009 11:05:02 GMT (10kb)**[v2]** Sat, 14 Nov 2009 11:40:16 GMT (33kb)*[Which authors of this paper are endorsers?](#)*

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

quant-ph[< prev](#) | [next >](#)[new](#) | [recent](#) | [0901](#)

References & Citations

- [SLAC-SPIRES HEP](#)
([refers to](#) | [cited by](#))
- [CiteBase](#)

Bookmark([what is this?](#))

 [CiteULike logo](#) [Connotea logo](#) [BibSonomy logo](#) [Mendeley logo](#) [Facebook logo](#) [del.icio.us logo](#) [Digg logo](#) [Reddit logo](#)