

## Quantum Physics

# Noise effects in a three-player Prisoner's Dilemma quantum game

M. Ramzan, M. K. Khan

*(Submitted on 14 Jan 2009 (v1), last revised 16 Feb 2009 (this version, v2))*

We study the three-player Prisoner's Dilemma game under the effect of decoherence and correlated noise. It is seen that the quantum player is always better off over the classical players. It is also seen that the game's Nash equilibrium does not change in the presence of correlated noise in contradiction to the effect of decoherence in multiplayer case. Furthermore, it is shown that for maximum correlation the game does not behave as a noiseless game and the quantum player is still better off for all values of the decoherence parameter  $p$  which is not possible in the two-player case. In addition, the payoffs reduction due to decoherence is controlled by the correlated noise throughout the course of the game.

Comments: 18 pages, 5 ps figures, 1 table  
Subjects: **Quantum Physics (quant-ph)**  
Journal reference: J. Phys. A: Math. Theor. 41 (2008) 435302  
DOI: [10.1088/1751-8113/41/43/435302](https://doi.org/10.1088/1751-8113/41/43/435302)  
Cite as: [arXiv:0901.2067v2](https://arxiv.org/abs/0901.2067v2) [quant-ph]

## Submission history

From: Muhammad Ramzan [[view email](#)]  
[v1] Wed, 14 Jan 2009 17:15:06 GMT (451kb)  
[v2] Mon, 16 Feb 2009 17:03:50 GMT (451kb)

*[Which authors of this paper are endorsers?](#)*

Link back to: [arXiv](#), [form interface](#), [contact](#).

## 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](#)