

## Accepted Manuscript

Quantum key distribution using a two-way quantum channel

Marco Lucamarini, Stefano Mancini

PII: S0304-3975(14)00695-1  
DOI: [10.1016/j.tcs.2014.09.017](https://doi.org/10.1016/j.tcs.2014.09.017)  
Reference: TCS 9867

To appear in: *Theoretical Computer Science*

Received date: 2 March 2009  
Accepted date: 5 January 2011

Please cite this article in press as: M. Lucamarini, S. Mancini, Quantum key distribution using a two-way quantum channel, *Theor. Comput. Sci.* (2014), <http://dx.doi.org/10.1016/j.tcs.2014.09.017>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Quantum Key Distribution using a Two-way Quantum Channel

Marco Lucamarini<sup>1</sup>

*School of Science and Technology, University of Camerino  
via Madonna delle Carceri, 9 - 62032 Camerino, Italy*

Stefano Mancini

*School of Science and Technology, University of Camerino  
via Madonna delle Carceri, 9 - 62032 Camerino, Italy*

---

## Abstract

We review a quantum key distribution protocol, recently proposed by us, that makes use of a two-way quantum channel. We provide a characterization of such a protocol from a practical perspective, and consider the most relevant individual-particle eavesdropping strategies against it. This allows us to compare its potentialities with those of the standard BB84 protocol which uses a one-way quantum channel.

*Keywords:* Quantum cryptography and communication security

---

## 1. Introduction

Since the seminal works by Bennett and Brassard [1] and by Ekert [2] Quantum Key Distribution (QKD) has made impressive progresses [3], which can be roughly grouped into two main categories: on the one side there are theoretical progresses, among which the unconditional security of QKD is the most relevant one [4, 5, 6, 7, 8]; on the other side there are experimental progresses, almost exclusively in the field of quantum optics, which recently led to long-haul and high-rate QKD experiments [9, 10, 11, 12]. The relevance of these advances

---

<sup>1</sup>Presently at Cambridge Research Laboratory, Toshiba Research Europe Ltd., 208 Cambridge Science Park, Milton Road, Cambridge, CB4 0GZ, United Kingdom

Download English Version:

<https://daneshyari.com/en/article/10333891>

Download Persian Version:

<https://daneshyari.com/article/10333891>

[Daneshyari.com](https://daneshyari.com)