



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Contribution ID: 190

Type: Oral Presentation

## Realization of B92 QKD Protocol Using id3100 Clavis2 System

Thursday, 12 July 2012 08:20 (20 minutes)

### Abstract content <br> &nbsp; (Max 300 words)

Quantum Key Distribution (QKD) is an encryption technique of securely exchanging a bit string (known as a key) between two communicating parties (known as Alice, the sender and Bob, the receiver) in the presence of an eavesdropper (known as Eve). This technique is based on two basic facts of quantum mechanics, namely uncertainty principle and no-cloning theorem. The first QKD protocol was developed in 1984 by Charles Bennett and Gilles Brassard (BB84). Since its inception, various QKD protocols have been developed. Examples include protocols developed by Bennett in 1992 (B92), and Valerio Scarani, Antonio Acin, Gregoire Ribordy and Nicholas Gisin (SARG04). These protocols (BB84, B92 and SARG04) are known as prepare-and-measure protocols and they use four, two and four quantum states respectively. Currently, BB84 is the default QKD protocol.

B92 was developed by Charles Bennett in 1992. Unlike BB84, which uses four polarisation states, B92 uses two non-orthogonal quantum states with a similar device setup as the BB84 protocol. Therefore, as opposed to BB84, B92 is easier to implement than BB84.

The purpose of this paper is to investigate the feasibility of implementing B92 QKD protocol using the id3100 Clavis2 system from ID Quantique. Currently, Clavis2 implements BB84 and SARG04 only.

### Apply to be<br> consider for a student <br> &nbsp; award (Yes / No)?

Yes

### Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?

PhD

### Main supervisor (name and email)<br>and his / her institution

Francesco Petruccione (petruccione@ukzn.ac.za)  
University of KwaZulu-Natal

### Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

Yes

**Primary author:** Mr SENEKANE, Makhamisa (Quantum Research Group, School of Chemistry and Physics, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa)

**Co-authors:** Mr MIRZA, Abdul (Quantum Research Group, School of Chemistry and Physics, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa); MAFU, Mhlambululi (Quantum Research Group, School of Chemistry and Physics, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa)

**Presenter:** Mr SENEKANE, Makhamisa (Quantum Research Group, School of Chemistry and Physics, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa)

**Session Classification:** Photonics

**Track Classification:** Track C - Photonics