



Contribution ID: 253

Type: Oral Presentation

## Non-reversal Open Quantum Walks

Wednesday, 5 July 2017 15:00 (20 minutes)

A model of non-reversal quantum walk is introduced. In such a walk, the walker cannot go back to previously visited sites but it can stay on the same site or move to a new site. The process is introduced on a line using the formalism of Open Quantum Walks (OQWs). Afterwards, the non-reversal OQW is demonstrated in  $2D$ . The “quantum coin” used consists of Kraus operators, each representing one direction. Examples of some trajectories and distributions are given. An interesting relationship is formulated between the radius of the spread and the number of steps of the walk. The results are compared with the ordinary OQW and the classical Self-Avoiding Walk.

**Apply to be considered for a student award (Yes / No)?**

Yes

**Level for award (Hons, MSc, PhD, N/A)?**

PhD

**Main supervisor (name and email) and his / her institution**

Supervisor: Professor Francesco Petruccione  
 Petruccione@ukzn.ac.za

Co-supervisor: Doctor Ilya Sinayskiy  
 Sinayskiy@ukzn.ac.za

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

**Primary author:** Mr GOOLAM HOSEN, Hazmatally (UKZN)

**Co-authors:** Prof. PETRUCCIONE, Francesco (UKZN); Dr SINAYSKIY, Ilya (UKZN)

**Presenter:** Mr GOOLAM HOSEN, Hazmatally (UKZN)

**Session Classification:** Theoretical and Computational Physics 1

**Track Classification:** Track G - Theoretical and Computational Physics