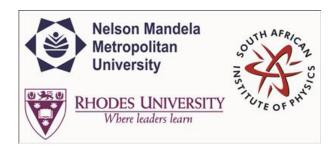
SAIP2015



Contribution ID: 132 Type: Oral Presentation

Hong-Ou-Mandel interference for the orbital angular momentum Bell States - a high dimensional analysis

Thursday, 2 July 2015 14:00 (20 minutes)

Abstract content
 (Max 300 words)
 dry-Formatting &
 &classed chars

Hong-Ou-Mandel (HOM) interference is a fundamental component in many quantum information protocols and one of the defining features of quantum science. Traditional HOM measurements are implemented in two-dimensional Hilbert spaces and are used to filter antisymmetric components from an input state. Here, we extend the concept of HOM interference to photons entangled in high dimensions, implementing a HOM measurement for orbital angular momentum (OAM) states. In this manner, we are able to filter the antisymmetric components from a high-dimensional entangled field. We use Dove prisms to control the precise form of the high-dimensional two-photon state and reveal state-specific constructive and destructive quantum interference. This work paves the way for high-dimensional processing of multi-photon quantum states, for example, in teleportation beyond qubits.

Apply to be < br > considered for a student < br > award (Yes / No)?

nc

Level for award

- (Hons, MSc,

- PhD, N/A)?

n/a

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

nc

Please indicate whether

br>this abstract may be

br>published online

(Yes / No)

yes

Primary author: Dr ZHANG, Yingwen (CSIR)

Co-authors: Prof. FORBES, Andrew (WITS); Dr ROUX, Filippus (CSIR National Laser Centre); Dr LEACH, Jonathan (IPaQS, SUPA, Heriot-Watt, United Kingdom); Ms AGNEW, Megan (IPaQS, SUPA, Heriot-Watt, United

Kingdom); Prof. KONRAD, Thomas (UKZN)

Presenter: Dr ZHANG, Yingwen (CSIR)Session Classification: Photonics

Track Classification: Track C - Photonics