Contribution ID: **178** Type: **Oral Presentation**

Quantum Photonic Entanglement

Tuesday, 5 July 2022 12:30 (15 minutes)

Path entanglement is an essential tool with regards to quantum information and communication protocols. We shall discuss the generation and measurement of path entangled photon states using pairs of single photons initially generated by Spontaneous Parametric Down-Conversion (SPDC). Path entanglement is generated through the use of a Mach-Zender (MZ) interferometer in one arm of the SPDC setup. We shall discuss the characterisation of the MZ interferometer as well as standard tests performed to indicate whether entanglement is present including protocols on determining the quality of the entanglement generated. These tests include a second order correlation $\left(g^{(2)}\right)$ measurement and a visibility measurement. These two tests determine the quality of the single photons being generated and the quality of interference of a photon with itself, respectively.

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

Yes

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

MSc

Primary author: SMITH, André (Stellenbosch University)

Co-authors: STEENKAMP, Christine (University of Stellenbosch); Prof. TAME, Mark (Department of Physics, Stellenbosch University)

Presenter: SMITH, André (Stellenbosch University)

Session Classification: Photonics

Track Classification: Track C - Photonics