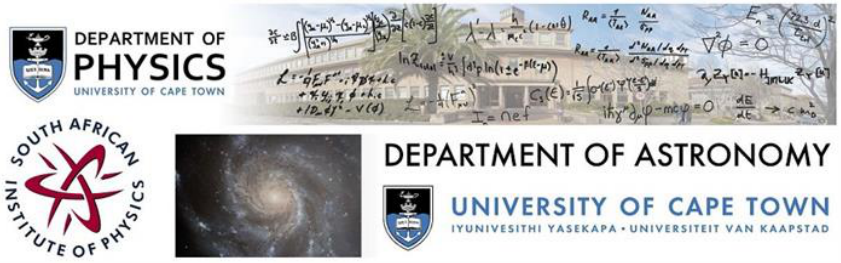

Contribution ID: **440** Type: **Oral Presentation**

Experimental characterization of a metamaterial optical polarizer in the quantum regime.

Wednesday, 6 July 2016 14:20 (20 minutes)

Abstract content
   (Max 300 words)
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Plasmonics is a fast growing field of research that enables ultra-compact devices in on-chip optical circuitry and a new class of optical material called metamaterials. Metamaterials are made from tiny plasmonic structures placed close together at the nanoscale, where the collective behaviour of all the structures gives rise to the bulk response of the material. Metamaterials have opened up many novel ways of controlling light, and in particular, controlling the polarization of light. An important optical component in this respect is the polarizer, which transmits light of one polarization while blocking light of another polarization. In our work, we have experimentally probed and characterized a metamaterial polarizer in the quantum regime. To do this, we prepared a range of different polarization-encoded single-photon states
and sent them through the metamaterial. We then performed quantum state tomography and obtained high fidelity output states (96%), in full agreement with theoretical predictions for an optical polarizer. Our study shows that metamaterials
may be used for building compact optical components in on-chip quantum photonic systems.

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