



Contribution ID: 524

Type: Oral Presentation

## Quantum Teleportation of photonic multi-level systems

*Wednesday, 10 July 2013 15:40 (20 minutes)*

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

This is the first of two new teleportation schemes for photons with multidimensional state space which we would like to discuss at this conference. In this scheme the transfer of the state of one multi-level photonic system to another remote system is achieved by means of implementing a measurement that projects onto an entangled state of several photons using a certain beam splitter array and photo detectors. The scheme generalizes an earlier version for polarization states based on the Hong-Ou-Mandel effect to excitations of an arbitrary number  $n$  of spatial modes of the electromagnetic field by using the properties of multi-particle interference. This teleportation scheme can be used to transfer the state of a single photon as well as the joint state of many photons simultaneously. In addition, it requires less additional photons per teleported unit of quantum information than earlier versions. However, the additional photons have to be prepared in a special entangled state. Reference: <http://arxiv.org/abs/1212.5115>.

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

No

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

Yes

**Primary author:** Prof. KONRAD, Thomas (UKZN)

**Co-authors:** Dr ROUX, F. S. (CSIR); GOYAL, Sandeep (UKZN); Dr GOSH, Sibasish (IMSC, Chennai, India)

**Presenter:** Prof. KONRAD, Thomas (UKZN)

**Session Classification:** Theoretical

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