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Type: **Poster Presentation**

Quantum entanglement with a Hermite-Gaussian pump

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**Abstract content
 (Max 300 words)**

Typically, a Gaussian mode is used to pump a non-linear crystal to produce pairs of entangled photons. We demonstrate orbital angular momentum (OAM) entanglement when a non-fundamental mode is used to pump a non-linear crystal. An approximation to an HG₁₀ Hermite-Gaussian beam is produced by introducing a phase step into the transverse profile of the pump beam. We show both OAM and angular position correlations between the entangled pair of photons, by using two separate spatial light modulators to perform the measurements. The transfer of the OAM spectrum of the pump beam to the entangled photons is clearly illustrated and corresponds well with previous results demonstrating OAM conservation. This is the first step towards tailoring the entangled quantum states.

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

Yes

**Level for award
 (Hons, MSc,
 PhD)?**

PhD

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

Andrew Forbes

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

No

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