



Contribution ID: 50

Type: **Poster Presentation**

## Uncovering Orbital Angular Momentum with Mode Sorters

*Tuesday, 4 July 2017 15:00 (20 minutes)*

Orbital angular momentum (OAM) carrying beams are ubiquitous in many experiments being performed today and cover a wide range of research, from surface micro-structure processing to optical tweezers and communications. It follows that these beams are a significant factor in the outcome of these research areas. Characterization of OAM beams lies in the ability to identify the OAM being carried. One such prominent method recently developed in 2010 by Berkhout *et al.* [1] is known as mode sorting whereby a geometric transformation is optically carried out on the beam. This converts OAM into transverse momentum, causing the beam to 'unravel' and allowing for the formation of spots with OAM-dependent positions through the Fourier transformation of a lens. We evaluate how the mode sorter achieves this transformation. Additionally, we experimentally demonstrate how the mode sorter works and explore the power and limitations of this method.

[1] Berkhout *et al.* 2010 Phys. Rev. Lett. 105 153601

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

Yes

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

MSc

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

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

No

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**Session Classification:** Photonics

**Track Classification:** Track C - Photonics