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## Controlled injection of higher-order modes into an optical fiber from a solid state digital laser

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**Abstract content**   
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Mode division multiplexing has been mooted as a future technology to address the impending data crunch of existing fibre networks. Present demonstrations delineate the light source from the mode creation steps, potentially inhibiting integrated solutions. Here we demonstrate an integrated mode generating source in the form of a digitally controlled solid state laser with an intra-cavity spatial light modulator. In our proof-of-principle experiment we create fibre modes on demand and couple them directly into a few-mode fibre, where after transmission they are decoupled by modal decomposition. This is the first demonstration of a single source for encoding information into the spatial modes of light.

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

NO

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

PhD

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

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

Yes

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Yes

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