

# SAIP2012



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Contribution ID : 314

## Modal Analysis through Complex Amplitude and Phase modulation

Thursday 12 Jul 2012 at 17:00 (00h20')

### Abstract :

We explore an alternative to the Correlation Filter Method (CFM) for the real-time analysis of laser modes using a phase-only spatial light modulator (SLM) operating in reflection mode. This procedure involves encoding a set of orthonormal basis functions into digital holograms by complex amplitude modulation into which the initial field is decomposed. The advantage of such an approach over the CFM is that prior knowledge of the field is not required and this technique allows any function to be encoded with real-time switching of the digital holograms on the SLM. We implement a modal decomposition on a set of modes propagating in a multimode optical fibre supporting 6 LP modes at  $\lambda = 1.064 \mu\text{m}$  (Core diameter = 25  $\mu\text{m}$ , NA = 0.064,  $V = 4.92$ ). We show that we can successfully decompose the field in amplitude and phase and reconstruct this observed field with very high fidelity.

### Award :

Yes

### Level :

PhD

### Supervisor :

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### Paper :

No

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**Session classification** : Photonics

**Track classification** : Track C - Photonics

**Type** : Oral Presentation