

Focus Issue: Spatial Light Modulators

Introduction

This issue of Optics Express deals with multiple quantum well optically addressed spatial light modulators (MQW-OASLM) . These devices were first demonstrated at Bell labs in Alistair Glass' group by Dave Nolte and Afshin Partovi.

Since those initial devices, great strides have been made in understanding the physics that governs device performance and in practical matters concerning fabrication of good optical quality material. As a result the field has begun to move way from device development and towards applications. Not surprisingly, the first set of applications that were investigated involved optical correlators. More recently, however, the application focus has shifted to various forms of optical non-destructive evaluation (NDE) of materials.

MQW OASLM devices are attractive for NDE because of their high sensitivity to light, good resolution and gray scale. The papers in this issue represent some of the diversity of NDE applications that are being investigated. The authors represent most of the groups actively involved in the field.

The paper by Lahiri et. al. is the most fundamental of the group and investigates the phenomena of two beam coupling. Two beam coupling can reveal a great deal of information about the internal dynamics of photorefractive materials, but in addition allows these materials to be use as extremely sensitive vibration monitors and velocimeters.

The paper by Jones et. al. shows a fascinating application of these materials to depth resolved imaging. While there are other techniques for doing this sort of measurement, such as optical coherence tomography in a scanning mode, the use of MQW OASLMs allows the data to be taken very quickly which is essential for many applications, particularly those with living organisms.

The paper by Rabinovich et.al. shows an application of MQW OASLMs to a traditional optical NDE technique, speckle photography. By keeping the measurement process in the optical domain very fast measurements can be made, allowing the recording of transient events that would be missed in a digital system.

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