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PROCEEDINGS OF SPIE

Vertical-Cavity Surface-Emitting Lasers XV

**James K. Guenter
Chun Lei**
Editors

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Introduction

On 26 and 27 January 2011 the Vertical Cavity Surface Emitting Lasers XV conference saw its second year in San Francisco as part of the SPIE Photonics West symposium. After a decade and a half of dedicated conferences, it is clear that VCSEL technology is well-developed, so much so that this year for the first time, a completely separate conference was held for Vertical External Cavity Surface Emitting Lasers (VECSELs), which share many structural details with VCSELs, and which in previous years, might have been included in the VCSEL conference. In addition, dozens of papers in other conferences either used or modified VCSELs for specific applications in biomedicine, communications, and sensing.

In the VCSEL conference itself, we saw some of the wide variety of applications that VCSELs are filling today, with papers on VCSEL wavelengths from the visible red out to nearly 3 μm in the infrared. Applications ranged from the very high power, as much as kW, for illumination and pumping, to extremely low power—and therefore “green”—short-range communications. Several papers vied for the highest-speed modulation of VCSELs, with rates as high as 40 Gbps demonstrated. New approaches to fabricating VCSELs and even monolithic VECSELs were presented. Some unusual VCSEL physics was presented, and even a few mysteries on the reliability and testing front. Finally, some specific sensing applications using modified VCSEL chips to enable extreme miniaturization were presented.

This proceedings volume contains the manuscripts of papers presented during the conference, papers that document the continuing advancement of VCSEL optoelectronic technology, and pave the way for VCSEL XVI next year.

**James K. Guenter
Chun Lei**

