Projects at the EPFL Center of MicroNanoTechnology

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| III-nitride based blue vcsels | | |
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| Project objective: Highly-reflective dielectric-based distributed Bragg reflectors (DBRs) have been developed (Fig. 1) to serve as top mirror in blue vertical cavity surface emitting lasers (VCSELs). A schematic drawing and an SEM cross-section view of such a device are depicted in Fig. 2 and Fig. 3, respectively. Electroluminescence (EL) spectra measured below and above threshold on a blue VCSEL are shown in Fig. 4. | | |
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| Figure 1: Reflection *R* and transmission *T* of a 7-pair SiO2/TiO2 DBR. | | Figure 2: Schematic drawing of a monolithic nitride-based VCSEL. |
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| Figure 3: SEM cross-section view of a processed VCSEL. | | Figure 4: VCSEL EL spectra below and at lasing threshold. |
| Techniques employed: E-beam evaporator (LAB600) for dielectric DBR deposition. | | |
| Publications: | | |
| [1] | G. Cosendey, A. Castiglia, G. Rossbach, J.-F. Carlin, and N. Grandjean, *Blue monolithic AlInN-based vertical cavity surface emitting laser diode on free-standing GaN substrate*, Appl. Phys. Lett. 101, 151113 (2012). | |
| [2] | G. Cosendey, J.-F. Carlin, N. A. K. Kaufmann, R. Butté, and N. Grandjean, *Strain compensation in AlInN/GaN multilayers on GaN substrates: Application to the realization of defect-free Bragg reflectors*, Appl. Phys. Lett. 98, 181111 (2011). | |
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