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| **Title:** | Achieving high reflectivity using GaAs and AlAs semiconductor DBR layers and alternatively by using Amorphous Silicon and SiO2 dielectric DBR layers in a VCSEL | | | |
| **Author(s) Name:** | **Rinku Basak** and Saiful Islam | | | |
| **Contact Email(s):** | rinku@aiub.edu | | | |
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| **Abstract:** |  |
| In this paper, the effects of using GaAs and AlAs in alternate Distributed Bragg Reflector (DBR) layers for a VCSEL have been investigated using computer simulation. It has been shown that by using GaAs and AlAs in alternate DBR layers, high reflectivity of 99.9% can be achieved using 20 pairs of layers on a single side. Next, the effects of using Amorphous Silicon and SiO2 in alternate DBR layers for a VCSEL have been investigated. It has been shown that only 4 pairs are needed to achieve 99.9% reflectivity. This is a significant saving of layers (space) compared to using semiconductor DBR layers. However, the semiconductor DBR layers mentioned above are advantageous because absorption of light in each layer of the dielectric DBR layers is high. The result obtained from this comparative study is expected to be valuable in developing new types of structures of VCSEL. | |