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| **Title:** | Effect of Refractive Indices of DBR Layers on the Reflectivity of a VCSEL | | | |
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| **Abstract:** |  |
| In this paper, the reflectivity of a VCSEL has been calculated by choosing the refractive indices of the two layers in a period of a DBR stack alternately as high and low at first, and next, by choosing a period of low and high. Computation has been done by considering an even number of layers in the stack (i.e., N = 40) at first, and next, computation has been done by considering an odd number of layers in the stack (i.e., N = 39). Higher reflectivity has been achieved for a high value of refractive index in the first layer compared to second one by considering both even and odd number of layers in the DBR stack. A reflectivity of 99.9% has been achieved for 40 layers in the stack using GaAs (n = 3.52) as the first layer and AlAs (n = 2.95) as the second layer in a period of the stack. For the same number of layers 98% reflectivity has been achieved using AlAs (n = 2.95) as the first layer and GaAs (n = 3.52) as the second layer in a period of the stack. Nearly same results have been observed for an odd number of layers in the stack. It has been observed that the order of the refractive indices of DBR layers in a period of the stack effects the overall mirror reflectivity. The reflectivity has also been calculated by increasing the refractive index of the substrate. The reflectivity is increased by increasing the refractive index of the substrate for a high value of refractive index in the first layer compared to second one. | |