

Experimental demonstration of a flexible and stable semiconductor laser linewidth emulator

Abstract

We propose and demonstrate experimentally a laser source whose linewidth is adjustable independently of its other characteristics. This source can be used to test whether a particular laser would be suitable in a system, without the need to purchase several different lasers. It also has the advantage that the linewidth is generated digitally so it is extremely stable over time. We demonstrate a dialed-linewidth emulator between 256 kHz to 150 MHz. The narrowest linewidth shown by this technique is the original linewidth of the semiconductor laser source used in the setup. We also investigate the effect of driving our modulator into its nonlinear range.