Optics: Mastering bandwidth

I-Micronews

Transmitting information as pulses of light through fiber-optic cables is the fastest and highest-bandwidth communications technology that exists today. Yet even this technology is being pressed to carry ever-greater quantities of information. One way to overcome this problem is to transmit light of different wavelengths simultaneously—an approach known as wavelength division multiplexing. However, the technique requires the use of tunable lasers, which are relatively expensive to produce. Hong Cai at the A*STAR Institute of Microelectronics and collaborators from Nanyang Technological University and Hong Polytechnic University[1] have now developed a low-cost and tunable laser device made specifically for this purpose.

Fig1: A scanning electron microscopy image of the master and slave lasers integrated onto a silicon substrate to form a miniature tunable laser.

The new laser is constructed using microelectromechanical systems (MEMS) technology to achieve wavelength tunability. By moving a tiny mirror, the laser switches between different operating modes, each of which produces a different wavelength. This tuning capability is built into a ‘master’ laser, which injects laser light into a secondary ‘slave’ laser. The slave laser increases the power of the emitted light, suppresses unwanted wavelengths, and allows for the encoding of information by modulating the light intensity. The two-part configuration surpasses the performance of conventional tunable lasers, without increasing bulk or cost. SOURCE [1]

Links:
[1] http://www.i-micronews.com/lectureArticle.asp?id=6564