

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Semiconductor lasers in optical communication band with very broadband tunability GAGIK SHMAVONYAN, State Engineering University of Armenia — Because the optical fiber has the low-loss window covering from below 1300 nm to above 1600 nm, devices used for optical communication are required to have the broadband characteristics. Several types of non-identical multiple quantum wells had been experimented. One has five 6 nm $\text{In}_{0.67}\text{Ga}_{0.33}\text{As}_{0.72}\text{P}_{0.28}$ quantum wells and two 15 nm $\text{In}_{0.53}\text{Ga}_{0.47}\text{As}$ quantum wells, bounded by 15 nm $\text{In}_{0.86}\text{Ga}_{0.14}\text{As}_{0.3}\text{P}_{0.7}$ quantum barrier. One type of the non-identical multiple quantum wells has been used to fabricate the semiconductor optical amplifiers for semiconductor lasers with broadband tunability. Inserting the semiconductor optical amplifier in an external-cavity configuration with a grating as the feedback, the external-cavity semiconductor laser is tunable from 1295 nm to 1570 nm, which covers almost the entire low-loss window of the optical fiber. Also, using reflected-type grating telescope configuration, we are able to simultaneously generate two wavelengths. The two lasing wavelengths are tunable from a few nm separation to 170 nm separation. Simultaneous generation of two wavelengths at 1344 nm and 1514 nm in optical communication band is demonstrated.

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Date submitted: 03 Dec 2005

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